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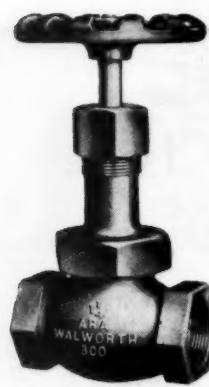


Fig. 256 Globe

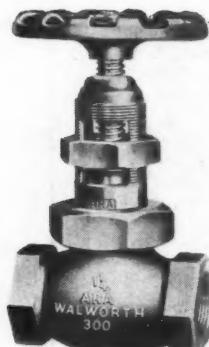


Fig. 259 Globe

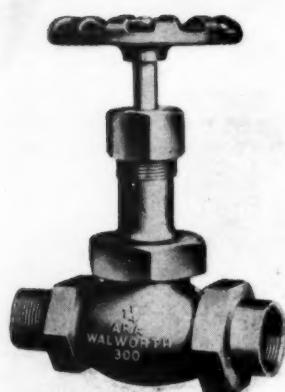
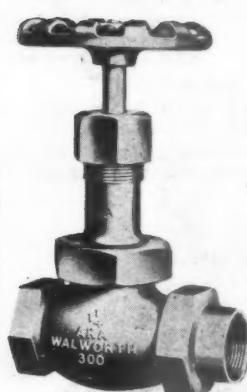
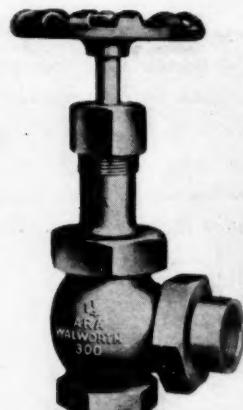
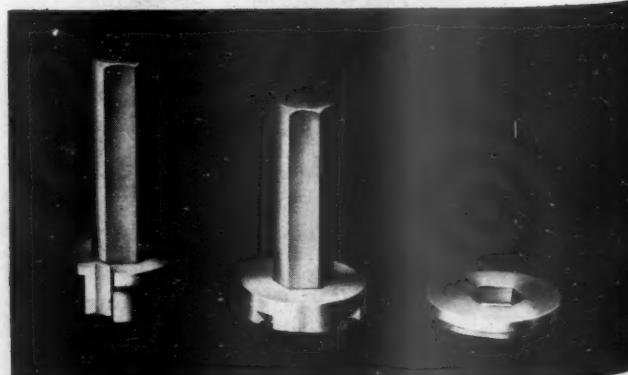
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Seat WrenchBronze Guide Bushing
which slips into body of
Valve to Guide Wrench*Walworth Seat Wrenches for removing
and inserting body seat rings*

The Co-ordinator And the Railways

The *Railway Age* has followed and reported with much interest, and usually with approval, the efforts of Co-ordinator of Transportation Eastman and his staff to promote a "more perfect union" of the railways in the interest of efficiency and economy. This paper's point of view is somewhat the same as theirs. Like them, it is concerned with the welfare of the railways as an industry, and, therefore, it has many times criticised competitive practices intended to gain advantages for some railways over others, but at the cost of reductions of the revenue or increases of the expenses of the industry as a whole. The Co-ordinator and his staff have opportunity to assemble information and recommend facilities and practices the use of which would be beneficial to the industry, but which, without outside pressure such as they can apply, might not be adopted because of competitive rivalries.

It is not possible, however, for this paper to regard sympathetically the manifestations of a recent tendency of the Co-ordinator and his staff to broadcast through the press caustic criticism of committees of railway executives and other railway officers whose views do not agree with theirs. The probable purpose of the broadcasting is to put public pressure on railway managements. Its certain effect is to discredit railway managements with law-makers and the public when this is highly undesirable. We refer especially to comments directly or indirectly emanating from the Co-ordinator's office regarding the container, freight car pooling and reaudit of accounts problems. The release to the press of interim reports attributing superficiality, indifference and bourbonism to railway officers is not sportsmanlike. Railway officers, for obvious reasons, do not feel free to answer in kind. It is not fair publicly to attack those who cannot safely strike back publicly.

Property Rights of Individual Railways

There is another factor of vital importance to consider. The railways are still separately owned and managed. The formation of a "more perfect union" to make reductions in competition that will increase net earnings is highly desirable. As long, however, as they are separately owned there cannot be formed any union that will relieve the management of each road of

the duty of protecting and promoting its interests. Consider, for example, the problems of co-ordinating the operation of terminals and of car pooling. Some railways have advantages over others due to their earlier construction, to more progressive management, or to better territorial location. These or any other advantages that enhance their earning capacity are property rights of their owners which it is the duty of their managements to protect.

Co-ordinator Eastman has expressed himself as opposed to gigantic consolidations under private ownership. This is equivalent to advocating the continuance of separate ownership and management, and obviously, should involve recognition that each management must continue to protect the interests of its own property. The formation of a "more perfect union," therefore, presents the problem of so co-ordinating the railways as not only to promote the interests of the industry, but as not to require any railway to forego existing advantages without full compensation in some form.

Criticism Based on Hindsight

The co-ordination of terminals and pooling of freight cars might produce economies and benefits. They present, however, many practical difficulties, and one of these is the means of securing railroads that now have advantages in respect to terminals and equipment against deprivation of the benefit of these advantages. What a railroad may do by its own efforts to reduce its competitive disadvantages is one thing. What may be done by government pressure or voluntary co-operation to reduce or increase the competitive advantages of different railroads is an entirely different thing. Human nature and property rights are quite as real and stubborn in the railroad as in any other business, and cannot rationally or fairly be disregarded.

A further consideration of importance is that in railroading, as in everything else, it requires much less ability to set up the objectives that should be sought than to devise and execute the means of attaining them. We have to deal with conditions as they are, not as we would like to have them. One of the main differences between theorists who never do much but criticise

practical men, and practical men who often lack proficiency in theorizing, but actually get things done, is in the extent to which they recognize and act on these simple but fundamental principles. There is an abundance nowadays of criticism of practical men. Much of it is emanating from persons in Washington, high and low, who never have successfully done the drudgery necessary to solving the technical and human problems of business management, and who apparently don't know that real achievement is more the result of drudgery than of what is called "vision."

Railway executives and other railway officers are receiving their full share of this criticism. They have shown lack of vision and foresight, it is said. They have expanded plants and fixed charges unduly, and failed to adopt obvious and effective means of meeting outside competition. They have done what they should not have done, and left undone what they should have done. Why was there little or none of this kind of criticism before the depression? There was then for some years much commendation of railway managements for the great increases made in efficiency and economy of operation. The Interstate Commerce Commission, of which the Co-ordinator is a member, emphasized them and the consequent increases in net operating income as a justification of its policy of regulation of rates under the Transportation Act.

Where Were the Critics During Prosperity?

Most of those in Washington who now criticise past business management in general also withheld the kind of criticisms they now make until the depression. If they knew so much about how business was being mismanaged and should be managed, why did they not point these things out and predict the inevitable collapse? Why did they wait until after the collapse to exhibit their wisdom regarding the unsound principles and practices, the stupidities and dishonesties, of the old deal, and demonstrate sooner that they could be corrected only by bureaucracy and regimentation engineered by clever "new deal" men lacking previous successful experience in business or reputation as economists?

We have the present railroad problem for the same reason that we have the present economic problems in general. We have them because past policies in both government and business were unsound; but their tendency to terminate the Hoover "new era" and make necessary the Roosevelt "new deal" was no more foreseen, or at least predicted, by men formerly, or now, in high government positions than by the practical men on the railroads or in other lines of business. These problems are not going to be solved by business men adhering to old and tried methods because they are old and tried. Neither are they going to be solved by government officials publicly scolding business men for not readily adopting new and untried methods. They are going to be solved, if at all, by combining, in the

light of experience, what is good in old methods that have been tried with what is good in new methods that are supported by valid evidence and arguments.

Forming a "More Perfect Union"

The *Railway Age* believes that the investigations and suggestions being made by the Co-ordinator and his staff will be helpful in promoting the "more perfect union" which is essential to the most efficient and economical operation of the railway industry. It is a great advantage that their approach is from the standpoint of the industry because each railway has more to gain by improving the condition of the industry than in any other way. But there are bound to be collisions between the Co-ordinator and his staff and the officers of individual lines if the former do not at all times recognize that the latter will, as a matter of right and duty, oppose any proposed policies tending to deprive individual railways of property rights that they have in existing competitive advantages. Everything practicable should be done to promote the welfare of the industry; but whatever is done for this purpose should be consistent with the property rights of individual railways; and railway officers should not be given scoldings for public consumption because they do not promptly accept proposals preliminary in character with the fairness or expediency of which they do not agree.

Railway and Motor Transport Wage Contrasts

The United States Bureau of Labor Statistics has at last published some official statistics on wages paid in bus and truck transportation. Based upon a field survey by its own agents, the Bureau finds that in July of last year the average bus driver in intercity service worked 51.1 hours a week, for which he received compensation totaling \$29.82, or an average of 58.4 cents an hour.

The closest resemblance on the railroad to this occupation is that of passenger engineer. The bus driver's duties, to be sure, are somewhat more exacting, in that he not only has to start and stop his vehicle, but guide its every movement as well. He also has to handle tickets and fare collections, a duty which on the railroads is never required of an engineman. As an offset to these duties, which the engineman does not have to perform, the bus driver does not have so costly a piece of machinery under his control as the engineman, and property damage which may result from a serious error upon his part will not likely be as great as would follow a serious mistake or dereliction by a locomotive engineman. On the other hand, the responsibility of the bus driver's job from a standpoint of the safety of human life, appears to be even greater than that of the

engineman. The average passenger train carries approximately 40 passengers, or slightly more than the capacity of a modern bus, but the passengers' chances of surviving a major train accident appear to be considerably greater than those of passengers in a serious bus accident. Not for many years, for instance, have as many passengers been killed in a train accident as those who succumbed in the terrible bus catastrophe at Ossining, N. Y., in July—despite the fact that the average train carries considerably more passengers than the average bus.

Harder Work, Longer Hours, Lower Wages

All in all, it plainly appears that the bus driver's job is more arduous and not less responsible than that of a passenger engineman. This being true, the contrast in the wage rates of the two positions is interesting and important. In July, 1933, the month for which the Bureau of Labor Statistics publishes its figures of bus drivers' hours and wages, the average passenger engineer in the United States worked 37.7 hours per week (26 per cent less hours than the bus driver) and received compensation totaling \$59.34 (almost twice as much as the bus driver received for a longer period of labor). The engineman's average hourly compensation was \$1.574, or 170 per cent more than the bus driver received.

In freight service, locomotive enginemans in July, 1933, averaged 41.9 hours per week, or 20 per cent fewer hours than intercity truck drivers. Their average hourly compensation was \$1.281, or 171 per cent more than the 47.2 cents per hour earned by truck drivers; and their weekly earnings averaged \$53.67, or 117 per cent more than the weekly pay of truck drivers for a longer period of labor in the same month.

Now, considering the fact that the jobs of the men who operate the vehicles, whether they move by rail or highway, are very similar, it follows that payment of much lower wages to its employees by one form of transportation than that paid by the other which competes with it, reacts to the disadvantage of the agency paying the higher wages. Not only that, but employees of the agency paying higher wages themselves suffer by loss of employment, as traffic is diverted by lower wage costs from the agency which pays high wages.

Much has been said—and rightly so—about the failure of the public authorities to levy charges upon commercial motor vehicles adequate to cover their proper share of road costs. Yet, from a standpoint of dollars and cents, the advantage which such carriers enjoy over the railroads by reason of lower wages is probably as great or even greater than that resulting from inadequate license fees. If the bus industry were forced to pay the same hourly wages to drivers as the railways are required to pay their enginemans, then the annual operating cost of a bus (assuming 3,000 hours of service per annum) would be almost \$3,000 greater than it is at present.

We are not contending either that the wages of enginemans are too high or that those of the drivers of intercity commercial motor vehicles are too low. We simply point to the fact of the wide discrepancy between them, for which there is absolutely no excuse, either in the character of the work or in the ability and skill required to do it. This discrepancy arises largely from the protective guardianship exercised by

Drivers' Wages—Highway and Railway Compared

	Intercity Bus Drivers*	Passenger Loco. Enginemas†	Difference in Favor of Loco. Enginemas	Intercity Truck Drivers*	Freight Loco. Engrs.	Difference in Favor of Loco. Engrs.
Av. hours per week	51.1	37.7	-26%	53.2	41.9	-20%
Av. hourly earnings	\$0.584	\$1.574	+170%	\$0.472	\$1.281	+171%
Av. earnings per week	\$29.82	\$59.34	+99%	\$24.68	\$53.67	+117%

* Bureau of Labor Statistics figures.

† Weekly hours of enginemans computed from Interstate Commerce Commission statistics by adding straight time hours actually worked and $\frac{2}{3}$ of overtime and constructive allowances (on assumption that such payments are at $1\frac{1}{2}$ time actually worked); this total then divided by number of employees on payroll at middle of the month, giving average hours per employee during the month; and result divided by 4.1666 to secure the average weekly hours (there having been 25 "working" days, excluding holidays and Sundays, in July, 1933). Hourly earnings computed by dividing hours worked, determined as outlined above, into total compensation. Weekly earnings arrived at by multiplying hourly compensation by average hours worked per week, computed as outlined above.

the federal government over organized railway labor, and its complete lack in the case of labor employed in interstate transportation by commercial motor vehicle. There is no warrant for such discrimination in sound public policy. It is unfair to railway labor, because it tends to shift traffic to the highways and thus reduce employment on the railways. It is not fair to highway transport labor for the government to withhold from it protection which it extends to competing labor on the railways. It is socially unjustifiable because the transfer of traffic to agencies paying low wages tends to lower the general level of wages, just as sweat shop competition inevitably lowers the level of wages in industry. It is unjust to railway owners, because it places a purely arbitrary and gratuitous handicap in the way of profitable operation of their properties in the public service. The only beneficiaries of the policy are the operators of the commercial vehicles, and those who manufacture such vehicles, since it diverts business to them to which they are not economically or ethically entitled.

Poorly Paid Remain Pensionless

And, incidentally, by what canon of reasoned public policy can Congress justify the compulsory payment of pensions to employees engaged in interstate commerce, whose wages average almost \$60 a week, while denying such protection to employees similarly engaged, but earning only half as much? Heretofore, most social legislation has been designed to protect workers with modest incomes, in the belief that they are less able to provide for their old age than those earning larger incomes. This view is unquestionably sound. Why, then, should it be completely disregarded by the government in dealing with employees engaged in interstate commerce?

Experts Reach Agreement On Equipment Costs

Representatives of railroads and Interstate Commerce Commission complete data on shop machinery and rolling stock

AS a result of studies of the Joint Equipment Committee of the railroads and the Interstate Commerce Commission, authoritative data have been prepared on the trend of costs of equipment and mechanical appliances used in railroad service. The committee is composed of representatives from the Eastern, Southern and Western groups of the Conference Committee of the Railway Presidents on Valuation and the Engineering section of the Bureau of Valuation of the I. C. C., as follows: J. Howland Gardner (chairman), New York, New Haven & Hartford; D. J. Brumley, chief engineer, Illinois Central improvement and valuation departments; S. H. Barnhart, engineering assistant to comptroller, Norfolk & Western; M. J. Cairns, senior mechanical engineer, Bureau of Valuation; F. H. Hardin, assistant to president, New York Central; W. H. Hulsizer, valuation, land and tax officer, Union Pacific;

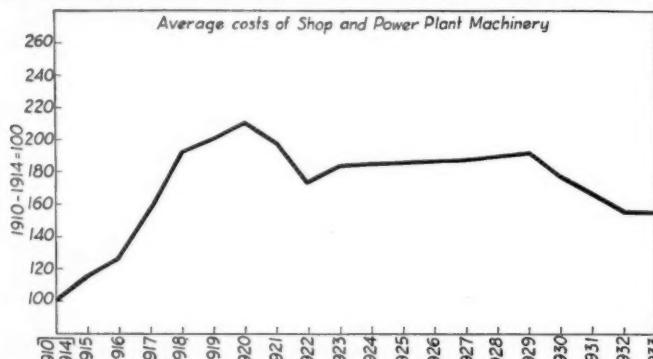


Chart Showing Average Relationship of Costs of Shop and Power Plant Machinery and Sub-Station Apparatus with the Period 1910-1914

C. T. Ripley, chief mechanical engineer, Atchison, Topeka & Santa Fe; C. H. Spencer, chief valuation engineer, Bureau of Valuation; J. R. Thompson, principal engineer—mechanical, Bureau of Valuation; M. Vestal, mechanical valuation engineer, Southern Pacific; F. O. Walsh, superintendent of motive power, Atlanta & West Point.

In its last report are historical costs of steam plants, shop machinery, power-plant machinery, substation apparatus and floating equipment from 1914 to 1933, inclusive; also costs of oil-electric and gas-electric locomotives from 1920 to 1932, inclusive; and the cost of work equipment from 1928 to 1930, inclusive, together with the average relationship of costs of steam locomotives, freight-train and passenger-train cars from 1914 to 1933. The average cost of steam-generating machinery to the railroads was 63 per cent higher in 1933 than comparable equipment cost from 1910 to 1914, and the average increase over the period 1910 to 1914, inclusive, was 19 per cent for comparable electrical machinery, 78 per cent for metal and woodworking machinery, 45 per cent for portable tools and apparatus, while the average increase in the cost of all shop and power-plant machinery was 55 per cent.

In the case of floating equipment, the average cost in 1933 was estimated to be 50 per cent above the cost in 1914. Comparable costs of steam locomotives were found to be 65 per cent above the 1914 values, those for comparable freight cars of all types 44 per cent higher; and those for comparable passenger and freight cars 61 per cent higher, after making proper allowances

Average Relationship of Costs of Shop and Power Plant Machinery

YEAR	Steam Generating Apparatus (1)	Electrical Machinery and Apparatus (2)	Metal and Woodworking Machinery		Tools and Portable Apparatus (5)	Average Group Nos. and Apparatus (6)	All Machinery and Apparatus (7)
			Class A (3)	Class B (4)			
1910-1914	100	100	100	100	100	100	100
1915	115	99	140	120	99	117	115
1916	132	114	144	122	114	126	126
1917	183	140	163	128	148	150	155
1918	211	172	210	184	177	190	192
1919	202	170	240	207	175	204	200
1920	218	176	244	210	190	213	210
1921	202	165	243	192	173	201	198
1922	186	138	193	170	162	175	173
1923	194	146	214	172	168	185	183
1924	193	152	213	176	172	187	185
1925	194	145	217	175	171	188	185
1926	194	143	219	178	172	190	186
1927	197	141	215	184	175	191	187
1928	198	139	221	184	176	194	189
1929	201	147	219	185	179	194	191
1930	185	135	202	170	165	179	176
1931	175	122	190	161	156	169	166
1932	163	119	178	150	145	158	155
1933	163	119	178	150	145	158	155

for specialties not included in older equipment. The committee found that the extent to which the cost of specialties has entered the cost of steam locomotives has steadily increased from 7.2 per cent of the total cost of steam locomotives from 1910 to 1914, inclusive, to 30 per cent in 1933.

Shop Machinery

In determining the relative costs of steam-plant machinery, the committee considered air compressors, air reservoirs, boilers, condensers, feedwater heaters, pumps, piping, tanks and similar equipment; while those for electrical machinery included generators, motors, recti-

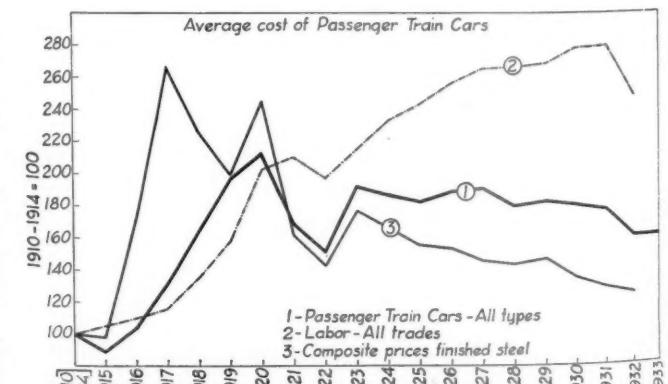


Chart Showing Average Relationship of Costs of Passenger Train Cars with the Period 1910-1914

fiers, electric welders, switch boards, transformers, storage batteries, wiring and conduit, etc. One class of metal and woodworking machinery studied included bolt cutters, drill presses, bolt forgers and headers, lathes

Average Original Cost—Oil-Electric and Gas-Electric Locomotives

Year	Units Purchased	Average Light Weight Lb.	Average Cost F.O.B. Builder's Works Per Unit	Average Cost Per 100 Lb.
1925	11	169,863	\$89,072	\$52.44
1926	5	197,400	106,389	53.89
1927	4	178,050	80,508	45.22
1928	5	151,400	66,922	44.20
1929	14	194,440	90,127	46.35
1930	43	250,600	117,991	47.08
1931	10	124,460	53,928	43.33
1932	3	128,000	48,694	38.10

of all kinds, planers, milling machines, boring mills, wheel presses, woodworking machinery, turning mills, etc., and the other class included bulldozers, traveling cranes, power hammers, grinders, pipe cutters, shears, plate rolls, flue welders and rattlers, riveters, jacks, etc.

The average cost of portable tools was determined by considering furnaces, forges, portable hand tools and

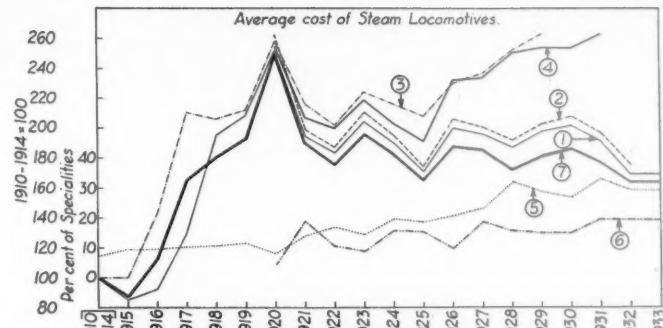


Chart Showing Average Relationship of Costs of Steam Locomotives with the Period 1910-1914

Curves Nos. 3 and 4 are based on a cost per lb. of a complete locomotive, disregarding changes in design and amount of special features, and therefore is not a relationship of costs of comparable units. Curve No. 7 is a relationship of cost of locomotives of comparable design and is a result of weighting curves Nos. 2, 5 and 6 and is therefore a relationship of costs of comparable units. See table for further explanation.

that estimates fairly represented the average relationship of costs.

Electric Locomotives

The cost data prepared for oil- and gas-electric locomotives consisted of the average original cost of the equipment purchased by the railroads from 1925 to 1932, inclusive, including the total cost with engineering, inspection and freight, as well as the cost at builders'

Average Relationship of Costs of Passenger-Train Cars

YEAR	Labor All Trades	Composite Prices Finished Steel	Passenger-Train Cars, All Types
1910-14	100	100	100
1915	105	98	89
1916	110	171	104
1917	116	267	132
1918	135	226	164
1919	158	199	197
1920	203	245	213
1921	210	162	169
1922	197	143	152
1923	215	177	192
1924	233	166	187
1925	243	156	183
1926	256	154	189
1927	265	146	191
1928	266	144	180
1929	268	147	*183
1930	278	135	*181
1931	279	129	*178
1932	247	125	*161
1933	...	...	*161

* Estimated.

appliances, shafting, pulleys, testing apparatus, cranes, post cranes, runways, hoists and trolleys and overhead structures supporting shafting, etc. The costs were obtained with the co-operation of manufacturers, and the composite figures were determined by considering the proportion which each group of figures bore to the total. Because of rapid changes in design and the impossibility of obtaining comparisons of cost on identical designs

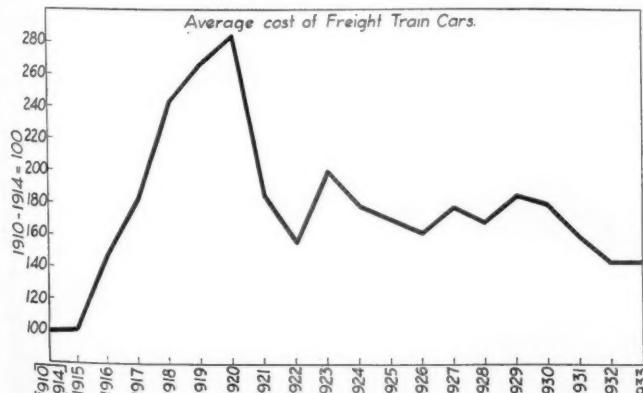


Chart Showing Average Relationship of Costs of Freight Train Cars with the Period 1910-1914

throughout the period, the trend in the cost of raw material, fabricated steel, labor, etc., particularly in the years 1930 to 1933, inclusive, were studied to assure

Average Original Costs—Work Equipment

Year	Units Purchased	Average Light Weight per Unit in Lb.	Average Cost F.O.B. Builder's Works Per Car	Average Cost Per 100 Lb.
BALLAST SPREADERS				
1928	2	115,000	\$20,000	\$17.23
1929	5	131,588	21,520	16.35
1930	8	83,500	12,458	14.56
BUSINESS CARS				
1928	9	190,667	74,854	39.26
1929	4	166,850	56,869	34.08
1930	None			
DYNAMOMETER CARS				
1928	None	125,600	79,183	63.04
1929	1			
1930	None			
LOCOMOTIVE CRANES				
1928	14	115,764	13,866	11.98
1929	13	127,350	15,072	11.84
1930	10	113,780	14,049	12.34
PILE DRIVERS				
1928	4	184,441	28,147	15.26
1929	2	189,750	29,883	15.75
1930	2	165,050	26,561	16.09
SCALE TEST CARS				
1928	1	80,000	5,995	7.49
1929	6	80,000	6,065	7.58
1930	None			
SNOW PLOWS—NON ROTARY				
1928	13	79,846	8,442	10.57
1929	4	83,000	8,951	10.78
1930	None			
SNOW PLOWS—ROTARY				
1928	None	191,300	45,269	23.66
1929	1			
1930	None			
STEAM SHOVELS AND DITCHERS				
1928	2	140,000	22,373	15.98
1929	1	161,250	31,462	19.51
1930	2	167,700	32,364	19.30
WRECKING CRANES				
1928	2	250,610	45,346	18.09
1929	4	249,770	44,395	17.77
1930	4	292,105	60,101	20.58

plants. These costs were obtained from records furnished by the railroads to the I. C. C. and disclose an average delivered cost of \$38.24 per 100 lb. in 1932, as compared with \$52.50 in 1925.

Work Equipment

The costs developed for work equipment consist of the average original cost of different classes of equip-

ment for the years 1928 to 1930, similar costs for the period from 1920 to 1927 having been developed previously. The statistics show that the average cost of ballast spreaders, delivered, was \$15.28 per 100 lb. in 1930, as compared with \$17.77 in 1928, while the average cost of locomotive cranes was \$12.71 per 100 lb. in 1930,

Average Relationship of Costs of Steam Locomotives

YEAR	Complete Locomotive				Specialties			
	Included in 19-a Basic Engineering Reports	Built Subse- quent to 19-a Basic Engi- neering Reports	Base Loco- motive F.O.B. Builders' Works	Complete Locomotive Actual Net Cost (Unad- justed for Special- ties)	Percent- age of Com- plete Loco- motive	Average Rela- tionship of Costs	Complete Locomotive as Sold (Includes Dis- count and Special- ties)	(8)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1910-1914	100	100	100	100	7.2	100	100	
1915	85	87	...	...	9.4	...	100	
1916	92	113	...	...	9.5	...	143	
1917	130	166	...	...	10.2	...	210	
1918	195	181	...	...	10.8	...	206	
1919	208	193	...	...	11.5	...	212	
1920	252	250	262	255	8.2	108	258	
1921	194	190	199	207	14.1	138	216	
1922	183	176	187	200	16.9	121	202	
1923	204	196	210	219	14.7	118	224	
1924	190	182	195	202	19.8	132	216	
1925	171	166	174	191	18.9	131	208	
1926	200	188	206	232	20.8	120	230	
1927	196	186	201	234	23.3	138	236	
1928	187	173	192	251	32.1	132	252	
1929	198	182	203	254	29.2	131	263	
1930	202	187	208	254	27.4	131	...	
1931	*192	*178	*197	262	33.7	140	...	
1932	*170	*165	*176	...	*30.0	*140	...	
1933	*170	*165	*176	...	*30.0	*140	...	
Curve No.	1	7	2	4	5	6	3	

* Estimated.

as compared with \$12.43 in 1928, and that of steam shovels and ditchers was \$20 in 1930, as compared with \$16.44 in 1928.

Steam Locomotives

The relative costs of steam locomotives are divided into several groups. In Column 2 of the table and Curve 1 of the chart on steam locomotives are presented the relative costs of a comparatively plain locomotive of the design considered in the original valuation studies of the railroads. In Column 3 and Curve 7 are shown the relative costs of a more modern locomotive, built subsequent to the original valuation studies. This segregation was made because the rapidly increasing percentage of locomotive specialties after 1920 made it practically impossible to find a single average relationship that would fairly apply to all locomotives of the railroads. The effect of the specialties on the comparative costs of locomotives will be seen in Column 5 of the table showing the relative net cost of a complete locomotive unadjusted for specialties; also in Columns 6 and 7, showing the proportional amount and relative cost of the specialties, and Column 8 showing the relative cost of a complete locomotive as sold with the discounts and specialties included. The figures for the years 1932 and 1933 were estimated on a basis of the trend of material and labor costs because of the small number of locomotives which were purchased during the period.

Freight-train Cars

The relationship of costs of freight-train cars were divided to show separately the relative cost of composite box and auto cars, all-steel box and stock cars, composite stock cars, composite refrigerator cars, all-steel gondola and hopper cars, composite gondola and hopper cars, composite cars of all types and all-steel cars of all types. The average for all types of freight-train cars, as shown in the last column of the table and also in the

curve, represents the cost of each group combined in accordance with the proportionate quantity of each class of equipment to the total for all railroads. As in the case of steam locomotives, the cost data for freight-train cars for the years 1932 and 1933 were prepared in part from estimates based on the consideration of material and labor prices.

Passenger-train Cars

Five groups of equipment were analyzed in determining the relative costs of passenger-train cars, one group consisting of coaches and smoking cars; the second group consisting of chair cars; the third group consisting of baggage and express and express cars; the fourth group, baggage and mail, mail and postal cars; and the fifth group, passenger and baggage cars. These five types of cars comprise the greater proportion of all passenger-train cars and are the types that have changed the least in design from year to year. Since the cars purchased subsequently to 1928 were not fairly comparable with those during the period from 1910 to 1914, the relationship of costs for the years 1929 to 1933, inclusive, were estimated, using as a guide the rates of union labor in all trades and the composite prices of finished steel on the basis of 45 per cent labor and 55 per cent material.

While the comparisons which are shown for all years are based on the costs at the builders' works, they fairly express the relationship of average costs on the carriers'

Average Relationship of Costs of Freight-Train Cars

(Based on Cost of "Base Car" F.O.B. Builders' Works)

YEAR	Box and Auto				Gondola and Hopper				ALL TYPES			
	Box Composite	Auto Composite	All Steel	Stock Car	Refrig- erator	Flat	All Steel	Com- posite	Com- posite	All Steel	Com- posite	Freight Train Cars
1910-14	100	100	100	100	100	100	100	100	100	100	100	100
1915	...	...	...	...	...	...	...	...	...	...	...	101
1916	...	...	...	...	...	...	...	...	...	...	...	148
1917	...	...	...	...	...	...	...	...	...	...	...	183
1918	...	...	...	...	...	...	...	...	...	...	...	243
1919	294	307	301	300	281	260	273	295	274	284	267	
1920	204	204	204	173	204	199	169	180	199	184		
1921	157	145	159	170	144	143	160	159	144	155		
1922	205	204	207	209	205	186	203	205	190	200		
1923	178	180	179	199	180	171	176	180	177	179		
1924	175	168	173	183	159	156	174	175	160	171		
1925	172	158	169	180	170	153	164	169	156	162		
1926	184	157	163	187	178	165	186	184	162	178		
1927	176	154	167	179	160	156	171	175	156	169		
1928	192	167	186	199	179	165	207	193	168	185		
1929	192	168	196	192	172	175	208	192	170	180		
1930	...	130	...	...	174	171	...	155	*160			
1931	...	...	...	...	...	154	...	...	154	*144		
1932	...	...	...	...	...	...	...	...	...	...	...	*144
1933	...	...	...	...	...	...	...	...	...	...	...

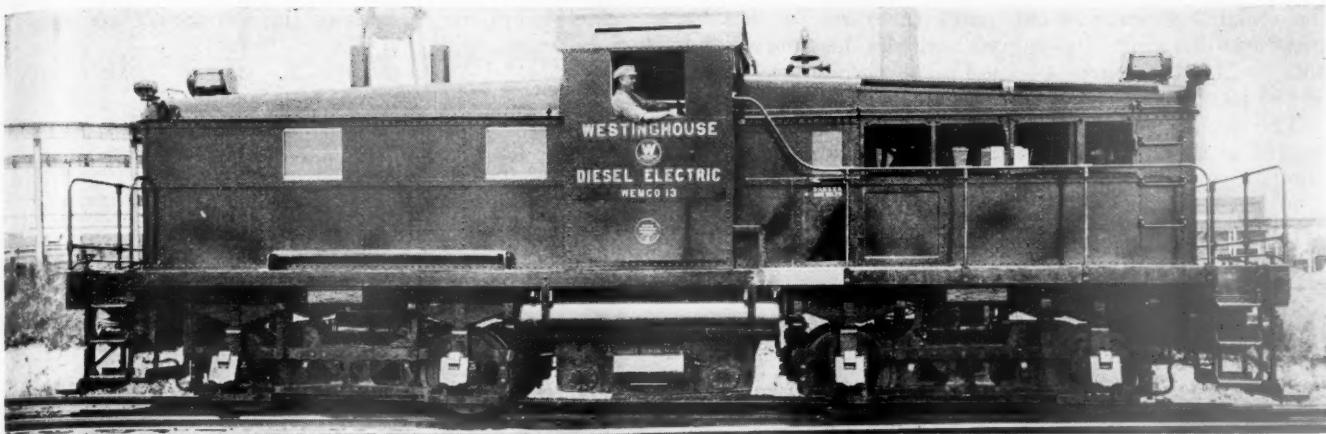
* Estimated.

lines, it having been found that, except on a few carriers where the cost of freight is substantial, the weighted effect of freight and miscellaneous costs on the comparisons, one year with another, is, for all practical purposes, negligible.

* * *



By the Use of a Fleet of Specially Built Trucks, the L. & N. E. of Great Britain Provides "Stable-Door Delivery" for Horses



Westinghouse 800-Hp. Diesel-Electric Locomotive with Central Cab

Westinghouse 800-Hp. Diesel-Electric Heavy Switching Locomotive

**Center cab unit, powered with 12-cylinder V-type engine,
designed for maximum visibility**

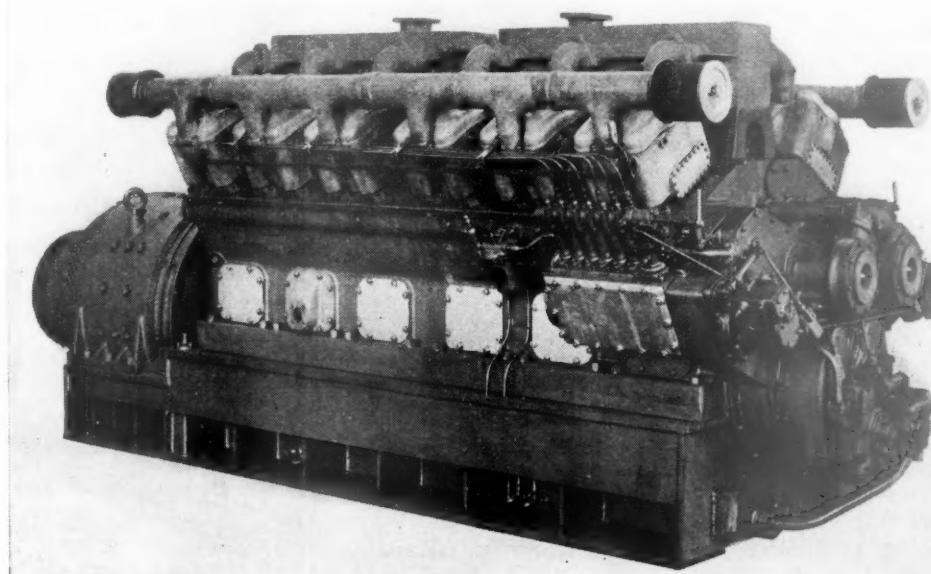
THE Westinghouse Electric & Manufacturing Company has recently completed, at its South Philadelphia Works, a Diesel-electric locomotive incorporating many interesting features desirable for heavy switching or combined switching and transfer service. Special attention has been given to the problem of providing the maximum in visibility for the operator and accessibility of all important parts. The power plant is located under one hood and in the other are the engine-cooling system, locomotive air compressor, control equipment and the storage battery.

The cab and the running gear were built by the Baldwin Locomotive Works and the underframe was cast and machined by the General Steel Castings Corporation.

The power plant consists of a Westinghouse, 12-cyl-

inder, 60-deg., V-type Diesel engine developing 800 b. hp. at 900 r.p.m. It is of the solid injection type, using heavy fuel oil, and operates on the four-stroke cycle principle. This engine alone weighs 30 lb. per hp. and, including the generator, 40.5 lb. per hp. Its overall length is 16 ft. and it has a maximum width of 5 ft. 7 in. and a height of 5 ft. 6 in. The weight includes the bed plate which can be dispensed with in those applications, such as this locomotive, where the underframe construction permits mounting directly on the frame. The rods from each pair of 60-deg. V-type cylinders drive on a common crank pin, the cylinders being offset to provide for this.

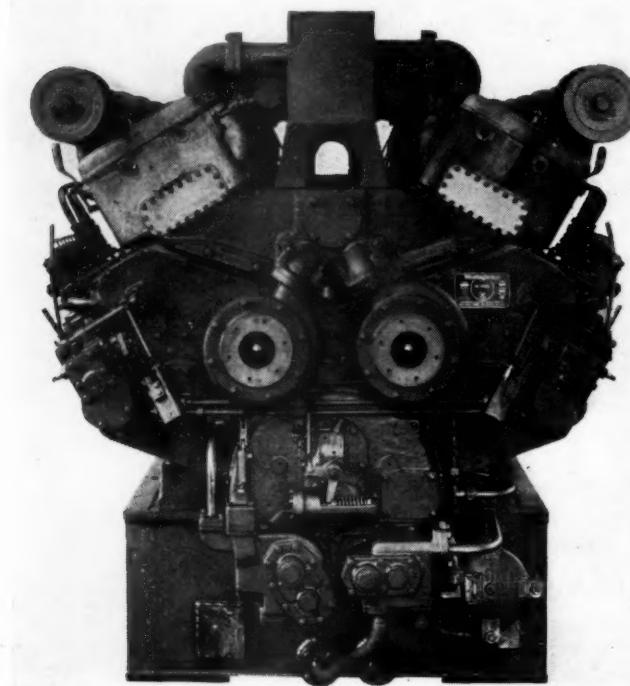
Connected to the two openings on the exhaust muffler are exhaust ejectors which are so designed that an equal volume of air from the engine room is drawn out with



Westinghouse 12-Cylinder, V-Type Diesel Engine Developing 800 B. Hp. at 900 R.P.M.

the exhaust gases. It eliminates the need for flexible couplings between the engine and the locomotive cab and enables the exhaust fumes to be thrown well clear of the locomotive.

The engine has two camshafts driven from gear trains located at the end remote from the generator. The fuel pumps are located on each side of the engine, grouped



End View of the Engine Showing the Accessories

in banks of six, with an individual pump for each cylinder. Two water pumps are located at the front end, supplying 160 gal. of water per min. to each bank at top speed. The air intake manifolds are fitted with air strainers. The lubricating oil filter is on the right-hand side of the bed plate and is accommodated externally. The vibration damper is attached to the crankshaft underneath the two water pumps.

Replaceable parts, such as pistons and rings, wrist pins, cylinder liners, cylinder-head valves, atomizers and fuel pumps, and the majority of engine auxiliaries are identical in all Westinghouse engines.

The single bearing main generator converts the mechanical power at the engine shaft to electrical energy for use of the traction motors. The auxiliary generator frame is mounted on a main generator bearing bracket with its armature on an extension of the main generator shaft. The truck frames are the cast-steel bar type located outside of the wheels and fitted with pedestal caps. The springs are suspended over the journal boxes to which their load is transmitted by saddles. The suspension is of the three-point type. The springs on one pair of wheels are attached directly to the frame by hangers at the ends and the springs over the other pair of wheels are cross-equalized at their outer ends with the center of the cross equalizer suspended from the end frame of the truck. Four traction motors supply the propelling force for the locomotive and are geared to each of the driving axles through a pinion on the motor shaft and the gear on the driving auxiliary. The locomotive is equipped with Westinghouse torque control and dual control stations developed especially for Diesel electric switching locomotives to provide maximum flexibility with one-man operation.

The general dimensions of the locomotive are:

Length inside coupler knuckles.....	42 ft. 6 in.
Length of operator's cab and hoods.....	35 ft. 6 in.
Over all width.....	10 ft. 2½ in.
Height from rail overall (at operator's cab).....	14 ft. 0 in.
Height over equipment hoods.....	12 ft. ½ in. and 11 ft. 3 in.
Truck center distance.....	21 ft. 0 in.
Truck wheel base.....	8 ft. 0 in.
Diameter of drivers.....	36 in.
Total weight of locomotive.....	220,000 lb.
Starting tractive force at 30 per cent adhesion.....	60,000 lb.
Continuous tractive force at 11.75 m.p.h.....	20,000 lb.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading for the week ended August 4 totalled 611,298 cars, an increase of 2,450 cars as compared with the week before but a decrease of 9,184 cars as compared with the corresponding week of last year. As compared with 1932, however, this was an increase of 114,672 cars. Coal and ore loading showed decreases as compared with the week before and with last year, while miscellaneous freight and live stock showed increases by both comparisons. Grain and grain products also showed an increase over last year. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week Ended Saturday, August 4, 1934

Districts	1934	1933	1932
Eastern	130,175	138,059	113,293
Allegheny	111,524	129,245	93,489
Pocahontas	39,097	49,277	33,232
Southern	82,573	83,813	71,407
Northwestern	96,949	89,873	63,337
Central Western	99,825	84,218	80,688
Southwestern	51,155	45,997	41,180
Total Western Districts	247,929	220,088	185,205
Total All Roads	611,298	620,482	496,626
Commodities			
Grain and Grain Products	42,820	29,657	37,232
Live Stock	27,746	15,048	14,933
Coal	99,099	116,800	78,404
Coke	4,735	6,788	5,245
Forest Products	22,048	27,934	14,253
Ore	30,170	31,563	5,953
Merchandise L.C.L.	159,872	173,332	166,977
Miscellaneous	224,808	219,360	176,339
August 4	611,298	620,482	496,626
July 28	608,848	644,839	511,103
July 21	614,864	656,380	501,912
July 14	602,778	653,661	503,761
July 7	519,807	543,510	415,928
Cumulative total, 31 weeks.....	18,357,926	16,463,172	16,537,150

The freight car surplus for the first half of July averaged 339,879 cars, an increase of 2,273 cars as compared with the last half of June. The total included 195,740 box cars, 102,060 coal cars, 20,185 stock cars and 9,120 refrigerator cars.

Car Loading in Canada

Car loading in Canada for the week ended August 4th totaled 42,196, or 1,535 cars fewer than for the previous week but 4,421 cars more than for the corresponding week last year, according to the compilation of the Dominion Bureau of Statistics.

Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:	
August 4, 1934.....	42,196
July 28, 1934.....	43,731
July 21, 1934.....	44,751
August 5, 1933.....	37,775
Cumulative Totals for Canada:	
August 4, 1934.....	1,310,467
August 5, 1933.....	1,094,887
August 6, 1932.....	1,262,194
	698,985
	558,647
	606,934

Per Diem Versus Pooling

Argument developing between railroads and Co-ordinator's organization on car-handling methods

A CONTROVERSY of considerable proportions between Co-ordinator Eastman and his Section of Car Pooling on the one hand and the railroads on the other on the old question of the merits of freight car pooling seems to be in prospect as the result of Mr. Eastman's promise, in his letter to the Regional Co-ordinating Committees on July 26, to submit specific recommendations for changes in car-handling methods, and the accompanying statement of O. C. Castle, director of the section, that the presentation of a pool plan, with facts and arguments in support of it, will be made "at the proper time."

Neither side has yet attempted to present its complete argument on the subject but both have anticipated it in a preliminary way in the statements which accompanied Mr. Eastman's letter, which was published in the *Railway Age* of August 11. He enclosed a statement by Mr. Castle in reply to a report submitted by the general committee, transportation division, of the American Railway Association, covering a study made by a special committee of transportation department officers of the co-ordinator's statement of October 10, 1933, in which he had asked the committee to consider methods of reducing wasteful empty car mileage and had offered them an opportunity to suggest any remedies which might seem to them more practicable than a pooling plan. Some of the more general statements made by Mr. Castle and the railroad committee were published in the issue of August 11 and their comments, amounting to a preliminary debate on the subject of car pooling, are given below.

The railroad committee placed its reliance mainly on the per diem system, adopted in 1902, for reimbursing the car owner for the use of its property and for restoring it automatically to its owner's rails when made empty under the Car Service Rules. The committee said that for 30 years the plan has worked satisfactorily but Mr. Castle in his comments pointed out that the per diem rate had been changed 14 times and that, although the rate has been stationary at \$1 since November, 1920, it is only an "average" rate, paid for a car worth \$3,000 or one worth only \$500 and regardless of variation in car repair costs. The committee found that, generally speaking, the Car Service Rules effectively accomplish the purpose of promptly returning cars to owning territory, with a minimum of empty mileage, and, in such operation, maintain a balanced train service.

Mr. Castle, however, denies that the plan has worked satisfactorily as regards its efficiency in returning cars, asserting that when this is accomplished it is at the expense of wasteful empty mileage and that there has been growing dissatisfaction with conditions on the part of car service officers for 14 years. He also objected that the railroad committee apparently gave no consideration to a form of combined mileage and per diem or to the adoption of some form of control over relocation as a substitute for the automatic action of per diem. He says that efforts of railroad committee members to bring about changes in the present system and practices have "either been stifled in committee through executive orders governed by a policy of the controlling minority,

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disapproved by the parent associations, or defeated by minority votes in letter ballots," and that efforts to bring about impartial considerations of pool plans since the period of federal control "have been definitely suppressed by executive authority."

"In periods of heavy demand", he said, "the owner's control over his cars does not go beyond his right to collect rental from the road which elects to use them. When the demand lessens, the owner finds his cars returning empty, burdening him with the carrying cost during the periods of surplus, and whatever emp'y haul is involved in this movement."

Both Mr. Eastman and Mr. Castle have attempted to draw a distinction between the views of transportation officers as individuals and those expressed by committees of the A.R.A. In his letter of October 10, Mr. Eastman said, "it may be that committees or organizations which are available for your assistance may be able to develop a remedy or remedies more practicable or otherwise better than any which my staff will find it possible to develop", but in his recent letter he questioned "the propriety of placing the inquiry so completely in the hands of those responsible for the rules and their application" and said he was reliably informed that many of the practical transportation men who constitute the special committee "recognize the defects in existing methods."

The railroad committee in its report took occasion to give its reasons for declaring a pooling plan impracticable, and Mr. Castle replied, in part as follows:

Railroad Committee Argument Against Pooling

There probably is not one transportation or car service man in the country who has not at one time or another given extended thought to the practicability of pooling cars and its effect on car handling, railroad operation, and the shipping public. The subject has been discussed and debated. It has its proponents and opponents, and there are those who pursue a more or less middle ground. It has been tried, and although it was thought by some to have been fairly successful the general verdict was that there was something lacking which must be supplied before complete approval could be given. Neither railroads nor shippers forget their experiences in the grain producing areas of the West when cars were pooled, and the general dissatisfaction which then existed with few cars available, and none in many instances, and those which were available were largely unfit for the service for which they were needed.

In the course of its inquiries and studies the Special Committee had before it for questioning, advice and counsel, representatives of thirty-eight of the larger Class I railroads. Of these only two were favorable to a pool and stated their belief that it was practicable and would be helpful as a measure of economy in railroad operation and reduction of empty mileage. The majority were outspoken in denial of many of the virtues claimed, believing them to be wholly theoretical and impracticable, creating problems now unforeseen, forcing an increased burden of supervisory expense, and making necessary additional equipment to handle an equal volume of business. In short, it was their belief that any theoretical savings would be more than covered by inevitable increases in operating and capital expense. Furthermore, it was their thought that shippers would not be as well cared for as under present plan of car handling. Some of these representatives, once proponents, have now become opponents of the pooling plan. It is significant that, so far as it known, the reverse is not true. It is apparent that the weight of opinion is cast as a result of experience, and of more mature judgment.

The few proponents of a pool propound many arguments in its favor, among which are—

Reduce capital expense;

Reduction of maintenance costs through increased standardization and "nationalization" of shop facilities;

Economy to result from quantity purchase of cars and parts;

Saving of empty mileage by the elimination of the cross-haul of cars of the same type;

Distribution of cars to loading areas and to industry is simplified.

Excessive switching is avoided;

Direct versus circuitous movement of cars to loading territory;

Great flexibility in use, hence less number of units required.

It is the box, or house, car that appears to hold the broadest opportunity for saving of mileage under a pool plan by reason of its being more nearly a general service car than other types. Study has been given to the subject of a box car pool, and conclusions reached are that it is impracticable for the following reasons:

(a) The direct interests of the shipper as affected by methods of car handling cannot be overlooked when considering the advisability of pooling equipment. There is under existing arrangements a direct means of dealing as between the patron and the railroad, and the railroad having control of its equipment is in a position to give the shipper unqualified assurance as to what it can do, while if obliged to deal indirectly such as with some outside agency and between which there lacks a certain community of interest, the shipper is not likely to obtain the same degree of satisfaction. Present assurances against car shortages and other difficulties with respect to car service are too great an asset to be relinquished by any possibilities inherent in a changed method of car handling.

In this connection we should not be unmindful of the responsibility of the carriers with respect to adequate car service as defined in the Transportation Act of 1920.

(b) There are about one million box and automobile cars. They vary in age, character of construction, length, height, width and capacity; from 36 to 50 feet in length, from 8 to 10 feet-plus in height, and from 60,000 to 120,000 lbs. capacity. They were designed and built for service of the owning road to meet the needs of its shippers. They are not generally interchangeable as to serviceability as between different parts of the country, in fact they are not interchangeable on a grain-carrying railroad. By the acquirement of high carrying and cubical capacity cars Western grain-loading roads have been able to meet the demands during grain harvest, and without the previous recurring car shortages, and have also been able to boost the loading of wheat several tons per car, making possible considerable savings in operating costs.

(c) Car Service Rules are designed as a result of long experience to promptly and automatically return cars to owning territory, and with a minimum of empty mileage. Generally speaking, they effectively accomplish this purpose and, in such operation, maintain a balanced train service. A car pool will not further add, toward a reduction in empty mileage, anything in excess of what can be accomplished by the Car Service Rules. The operation of a car pool would require special orders to meet the requirements of relocation and distribution. Continued changes would be necessary, and experience has taught that frequent changes of orders of such character tend toward confusion. There would be required "overhead" central and district distributing bodies to endeavor to maintain the necessary balance as between railroads. Such organization would create other additional expense to the railroads which does not exist today. Further, an organization of this nature could not sufficiently anticipate requirements to avoid forced or emergency movements and added train miles would inevitably be required to relieve congestion of empty cars and to fulfill orders for tide movements.

Requirements of agricultural territories must be met at certain times of the year with volume movements. Such movements cannot be made under pool operation except by special orders, which means a forced movement of cars with added train miles. Under the present plan of operation added train mileage is avoided by the day to day movement in trains which must be operated for regular traffic. If a car must eventually move empty, the more promptly it is done the better.

(d) The question of car maintenance is fundamental. Car repair costs are a large item of expense. It is understood that a Special Mechanical Committee appointed by the Co-ordinator is making a study of this. All railroads group box cars into several different commodity classifications as to condition. Such classifications run as high as eight, ranging from the Class A carrying the maximum standard of maintenance required to handle flour, grain and grain products, sugar, tinplate, etc. down to the lowest class commonly termed "rough freight." Under these conditions there is unavoidable cross-hauling of cars of different classes. To reduce this empty cross-haul, would compel higher standards of maintenance with material increase in maintenance expense. While it might be possible to set aside a limited number of cars for local home road use and maintain them at less than Class A

standard, the fundamental purpose of car pooling would be largely defeated unless the major portion of cars moving in interchange were maintained on a Class A basis. The additional maintenance expense would necessarily be greatly in excess of the cost of the empty mileage inherent to the existing operations. There is ample evidence that the box cars owned by a single railroad may not successfully be operated on a pool basis, that is, without cross-haul to get cars into position for varying classes of loading available. If this is so on the individual railroad, the conditions are accentuated with cars in a general pool with resulting inordinate increase in expense.

(e) While in theory traffic could be handled with less cars under a pool, movements would inevitably be retarded and additional equipment would need to be provided. The experience of recent years has been helpful in proving that under the present efficient methods of handling equipment car ownership can be very materially reduced. All are familiar with the car shortages which recurred nearly every year until 1923. From 1925 to 1929 the volume of tonnage handled continued to increase and in each of those years it was greater than that of 1920. Contemporary with this increase in traffic, and during which period there were no car shortages, the ownership of equipment was steadily reduced. During the peak loading period of October, 1929, when there was the largest traffic movement of record, a surplus was reported of approximately 70,000 cars. The total reduction in railroad-owned equipment from the ownership of 1925, when such ownership was at its top, amounts to 375,000 cars, including 30,000 "condemned." It is not believed that this reduction would have been possible, and neither is it believed that the same satisfactory service, particularly in agricultural territory, would have been possible under pool operation.

Furthermore, railroads should be encouraged to own and maintain suitable cars to meet their requirements, as such requirements in one section of the country are in many respects unlike those of other sections. A railroad which has been provident and has maintained its equipment both as to condition and number has much to lose under a pool when it will be unable to control the equipment built to meet its needs.

(f) The possibility of saving of empty mileage under pool operation by avoidance of cross-hauls is undoubtedly over-estimated when all factors are taken into consideration. It was developed, and as presented in Part I, that approximately 3.6 per cent of the freight car mileage as reported represented cross-hauls which might possibly be subject to some curtailment. It is known that this 3.6 per cent did not cause any additional train miles. We have, therefore, a proposal by the adoption of which we might be enabled to save some portion of 3.6 per cent of the current mileage, but at a cost which threatens to be many times the amount to be saved including (1) depriving shippers of adequate and satisfactory service, (2) increased maintenance expense, (3) greatly increased cost of supervisory forces, (4) increased capital cost for additional units.

Mr. Castle's Reply

In replying to this report Mr. Castle said in part:

After outlining the subject in a general way, the report presents, under sub-headings, certain reasons which form the basis of the conclusions that a car pool is "impracticable." We shall treat these reasons as they are presented, separately:

(a) In this section the "shipper angle" is again injected. Here, as elsewhere, the report reveals the lack of a clear understanding as to the operation of a practical freight car pool.

The objection is made that shippers, whose dealings in car matters are now with the railroad direct, will be obliged to deal under a pool "with some outside agency." This objection is entirely without foundation. Pool operation would in no way affect the handling of car orders between shippers and the roads which serve them, the pool organization having no jurisdiction in local distribution.

Reference is also made to "present assurance against car shortages" as being "too great an asset to be relinquished" by the shipper. The report is not specific as to what these assurances are. For more than three years the general depression has been an assurance against car shortage. There is no evidence that a return to conditions of active demand would not be accompanied by conditions in car handling which have been common in the past.

(b) In this paragraph reference is made to the variety of types represented in the equipment of the country and the statement is made that these cars are not generally interchangeable as to serviceability between different parts of the country. The box car study of October 10, 1933, shows that approximately 50 per cent of the loaded box car mileage is made in foreign cars. It is difficult to reconcile this demonstrated fact with the theory that box cars are not suitable for interchange service. The theory is also at variance with conclusions of the report that the solution of the empty mileage problem lies in sub-

sizing the use of foreign cars by means of a premium, or compelling their use through a stricter enforcement of Car Service Rule I. As further refutation of the oft-repeated argument that requirements of western roads cannot be met with eastern cars, we cite Interstate Commerce Commission statistics for 1932, which show that as of December 31, for that year, the average capacity of all box cars owned by Class I railways in the eastern districts was 86,800 pounds; and that the average capacity of western district cars was 84,200 pounds. Given equal maintenance, there is no apparent reason why the average Pennsylvania, New York Central or Baltimore & Ohio box car, built within the past five years, is not as satisfactory and interchangeable on a western grain road as any of the modern western cars.

The report seems to assume that a pool contemplates the scattering of equipment without regard to its suitability for the traffic of a particular territory; which assumption ignores some of the fundamentals of a practical pool. Under an efficiently operated pool, it will not only be more economical, but more practicable, than under existing methods to relocate equipment currently in the territory and for the traffic for which particular types of cars are best suited. If there is a valid reason for retaining eastern cars in eastern territory, that purpose can be accomplished much more easily under an efficient pool than under existing rules. With the prevailing flow of traffic into the eastern territory exceeding by 50 per cent the available westward traffic, there is no economic justification for the use of an eastern box car for loading west of Chicago or the Mississippi river. Under pool operation such loading would be minimized.

(c) Under this heading reference is made to the effectiveness of car service rules over a long period in bringing about the automatic return of cars to owning territory and with a minimum of empty mileage. There is no question that the car service rules bring about the return of cars to owning territory, excepting where the holder elects to apply the car to his own use. Where this return results in an empty movement in the direction of traffic, it is economically unsound and it is the prevention of this operation that a pool is designed to accomplish. The statement in the report that this automatic return is effected with a minimum of empty mileage is not borne out by the box car study of October 10, 1933, which shows that in the direction of traffic foreign cars make an empty movement equivalent to 24.1 per cent of the loaded movement, whereas the system ratio is only 15.8 per cent. The positive statement is made that "a car pool will not further add toward a reduction in empty mileage anything in excess of what can be accomplished by the car service rules." This is, of course, a pure assumption; the committee was not familiar with the proposed methods of handling under a car pool and has admitted that there is no basis upon which to determine what the result might be. The statement is made that the operation of the pool would require special orders to meet the requirements of relocation and distribution, with frequent changes or orders tending towards confusion. No such result would necessarily follow. An efficient pool would provide for normal current movements with much more regularity and economy than obtain under the present system. Special orders would be confined to circumstances requiring special action, exactly as at present, except that under a pool the obligations and rights of the railroads would be definitely established and the special movements handled authoritatively.

The report assumes that the pool organization would create additional expense. The railroads are now spending approximately one half a million dollars a year upon an organization charged with responsibility in car handling. There would be no justification for duplicating this expense. Much of the present activity of that organization would be unnecessary under a pool or could be merged with the distribution work of the pool organization.

The report further reads, "if a car must eventually move empty the more promptly it is done the better." That is axiomatic. The objection today is that the car in numerous instances moves promptly when its eventual empty movement is not necessary. It is the plan of the pool to correct this wasteful condition.

(d) The discussion under this paragraph is based upon an erroneous assumption regarding the maintenance of cars for commodity loading. It is recognized that the requirements in various territories and on various roads differ greatly and that it is necessary to maintain equipment in condition to meet these varying requirements. No individual road undertakes to maintain all of its box cars in class A condition. On the contrary the efficient railroad determines the proportion of high-class cars required and maintains its equipment accordingly, weighing the expense of crosshaul against the expense of reconditioning. Under a properly operated pool, exactly the same system would be followed with respect to pool equipment on

the various participating lines. Again, in this discussion the report shows a lack of understanding of what a car pool really is.

(e) This paragraph is devoted to a discussion of the possibility of reducing equipment ownership under pool operation and a resume of the accomplishments in that direction under existing methods. The fact that equipment ownership has been steadily reduced while car shortages have been avoided, is open to different constructions. From one point of view it might prove only that the railroads were substantially over-equipped in the first place, or that equipment purchases, handled on an individual basis, have been excessive and have burdened the transportation system with an unnecessary overhead. This result might further be interpreted as having been achieved in spite of, rather than by reason of, an irrational and wasteful method of car handling. There is certainly no ground for the belief that the adoption of improved methods would not result in still further reductions in the total equipment necessary to meet the demands of the country.

A striking illustration of the burden of excess investment which the unregulated operation of freight cars has imposed upon railroads and through them upon the public, is afforded in the record of freight car construction over a period of several years. In the face of a continuous decrease in the aggregate ownership, which the report cites as evidence of efficient car operation, the unregulated construction on a purely individualistic basis, of facilities the use of which is essentially joint, proceeded in a spasmodic manner, which could not fail to result in substantially higher costs than would be incurred under a systematic and stabilized program. The result of these unco-ordinated methods is graphically shown in the chart. There is further cause for wonder in the apparent disregard of relative investment values or the assurance of adequate returns exemplified in the per diem rate of settlement for the use of freight cars.

In the history of large-scale private operations, it is probable that there is not another instance of individually-owned property amounting to billions in value contributed to a common service, with little or no actual control by the owner for a return which is grossly excessive in one instance and utterly inadequate in another.

Car pooling has been opposed by some on the ground that it is "Socialistic." That term is much more applicable to the conditions under which freight cars are now used and paid for than to a properly conceived and organized car pool, which in its operation would recognize and protect the rights of car owners to the use of their property and a compensatory return when used by others.

Stress is placed upon the theory that roads should be encouraged to own and maintain cars in good condition to meet their requirements, and that under a pool they would be unable to control their equipment. Statistics and official statements disclose the fact that, in periods of heavy demand, the railroads not only have less than 50 per cent of their cars on their own lines, but that equalization on an ownership basis or the return of cars of particular types or conditions is entirely beyond the control not only of the individual railroad but of their authorized agency, theoretically empowered to effectuate such regulation.

After more than fifty-four years of committee work, the American Railway Association has developed a standard box car, one which it has been claimed may be more generally utilized and economically repaired wherever located.

The railroads were aware in advance that a study of empty crosshaul was to be made during the week beginning August 1, 1933, and it is reasonable to expect that they would prepare and make as good a showing as was consistently possible. At the time of this study only 26.1 per cent of the total box cars on all roads were of foreign ownership, a most favorable condition, under which the railroads could "meet their requirements" with their own cars. The record, however, shows that 55 per cent of the box cars interchanged during the period of study were "foreign," and that the use of foreign cars on the basis of mileage was 89 per cent greater than of system cars. In other words, the 26.1 per cent of foreign cars made 49.4 per cent of the total box car-miles.

From these facts, it must appear that the "per diem urge" exceeded the obligations of the railroads to protect fully the peculiar "regional" requirements. Relieved of a "per diem urge" and under a properly co-ordinated system of general car distribution, the shipper's interest would be better protected through more flexibility in the use of equipment suited to his needs and without the incentive to crosshaul empty cars.

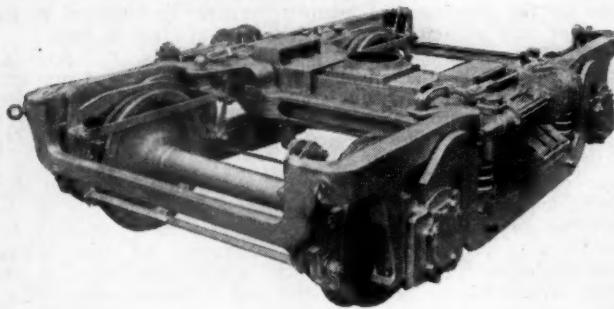
(f) The statement is made that the saving of empty mileage under pool operation is over-estimated. Reference is made to the fact that in Part I it is shown that only 3.6 per cent of the freight car mileage represented crosshaul. We have thoroughly analyzed this erroneous calculation in our comments on Part I. In commenting on the method by which it is proposed that this admitted excess, whatever its proportion, might be reduced, the report assumes that shippers will be deprived of adequate and

satisfactory service, that maintenance expense will be increased, supervisory forces will be increased and increased capital necessary for additional units. These items have all been discussed in their sequence and the baselessness and fallacy of the report's assumptions have been made clear.

New Adaptations of Simplex Clasp Brakes

A NUMBER of years ago the American Steel Foundries brought out the Simplex clasp brake, which through a system of levers applies retarding force through two brake shoes on each wheel. This arrangement was necessary since the braking load on a single shoe per wheel under modern passenger cars had become so great that the friction between the shoe and wheel had exceeded the point of maximum efficiency.

Later refinements of the clasp brake consisted in removing the air cylinder from the body of the car and



Simplex Clasp Brake Application to One of the Intermediate Trucks of the Zephyr—Air Cylinders and Slack Adjusters are Side Mounted

mounting two small air cylinders on each truck, this system being designated as the quick-acting unit-cylinder clasp brake.

The truck-mounted cylinders are more accessible for inspection and packing renewals and, owing to their smaller size, are much easier to handle than the heavy 16-in. or 18-in. cylinders used with body brake rigging. This arrangement eliminates the use of body brake rigging, saves weight and leaves the portion of the car underframe between the trucks available for the application of reservoirs, air conditioning apparatus, electrical and other special equipment.

The unit-cylinder clasp brake, being an independent unit, is not affected by curves regardless of their degree. The tendency toward twisting the truck levers on the conventional truck and body brake installation because of the angular pull from the body brake is entirely absent with the unit cylinder arrangement.

With the advent of the high-speed streamlined trains, an improved braking system especially adapted to the new conditions was essential on account of the low center of gravity and the limited space under the body of the cars. The American Steel Foundries unit cylinder clasp braking system used on the Chicago, Burlington & Quincy Zephyr, involved numerous engineering problems on account of the limited space on the trucks which was available for brake rigging, and the necessity of keeping weights to the minimum.

As the Zephyr is an articulated three-car train, employing a motor truck, two intermediate trucks and a

rear truck, it was necessary to design a special clasp brake arrangement for each of the three trucks. The design of the motor four-wheel truck brake involved unusual difficulties as, after the motors were mounted, little space remained for clasp brake rigging or air cylinders. These limitations were overcome by making an extension of the cast steel truck frame on one end and mounting a single air cylinder on this extension, installing the brake levers and rods above the motors and the truck frame.

More space was available on the four-wheel intermediate trucks and a small air cylinder with automatic slack adjuster was mounted on each side of the truck frame, as shown in one of the illustrations. This same plan was adopted for the four-wheel rear truck, although of a somewhat different brake cylinder arrangement from the intermediate trucks.

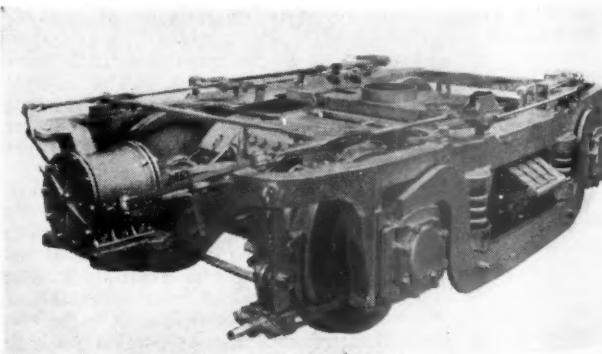
In the interest of a high factor of safety, and maintaining weights to a minimum, all parts, including levers, pull rods, hangers, etc., were manufactured from alloy steel.

All pull rods and slack adjusters were forged solid without welds. All cast parts were made of Hylastic steel, which has a tensile strength of 100,000 lb. per sq. in. and an elastic limit in excess of 65,000 lb. per sq. in. By the use of such high grade steels, a reduction in weight of approximately 30 per cent was obtained. All moving parts, subject to wear, were fitted with high quality, wear-resisting bushings, made from cold-drawn steel tubing, case hardened to the minimum 60 Rockwell "C" scale of hardness and accurately ground both inside and outside to finished dimensions. All pins were made from high-grade steel, case hardened and accurately ground to specified diameters, and fitted with hexagon slotted nuts and cotters.

To effect the high rate of retardation required to maintain stopping distances from speeds of 100 miles per hour within operating limits, the brake system is designed for a 200 per cent braking ratio at 100 lb. cylinder pressure and the brake-cylinder pressure is controlled automatically as the speed of the train decreases. This arrangement maintains a constant predetermined retardation rate and avoids the possibility of slid flat wheels.

Owing to the fact the Zephyr is a one-way train, or in other words, will always be operated as a unit with the power plant at the front, special features were incorporated in the brake design to assure even brake shoe wear. This involved a change in the usual design of head and mounting so that the center of the shoe pressure would balance the wheel rotation action.

This type of brake is also adapted to produce satisfactory results when applied to standard designs of six wheel passenger trucks.



Simplex Quick-Acting Unit Cylinder Clasp Brake as Applied to the Front Power Truck of the Zephyr

Statistics Point to End of Decline in Tie Renewals

Data compiled from annual reports of the railroads show sharp variations in individual records

THAT opportunities for further retrenchment by reductions in tie replacements are about exhausted, is evident from the tabulation of crosstie renewals for 1933, compiled by the Committee on Ties of the American Railway Engineering Association from statistics of the Interstate Commerce Commission. Of 149 railways represented in these data, 75 inserted more ties in 1933 than they did in 1932, 71 applied fewer ties, and three used substantially the same number as in 1932. Some of the fluctuations, both up and down, are pronounced, but on the whole they are moderate and in few cases do the figures for 1933 represent a continuation of the sharp downward trend that was so manifest from 1929 to 1932.

These compilations, which are presented in part in the table given here, show the tie renewals per mile of track maintained for the years 1929 to 1933, inclusive, the tie renewals expressed as percentages of the total number of ties in track, the average cost of treated and untreated ties and the percentages of each applied, the weighted average cost of all wooden ties and the cost of tie renewals per 1000 equated gross ton-miles. The table discloses some wide variations between the corresponding figures for different roads, but it is impossible to draw any valid conclusions from such comparisons without a detailed knowledge of physical conditions and a history of the practices and policies of the roads under consideration for a considerable period.

The lowest renewal rate in 1933 is that of the Pennsylvania-Reading Seashore, which inserted only 4 ties

per mile, compared with 23 in 1932. The next lowest rate was 22 for the Lehigh & Hudson River, which inserted 55 per mile in 1932. The Pittsburgh & Lake Erie, which had the lowest rate in 1932, namely, 5 ties per mile, inserted 35 in 1933. The heaviest renewal rate was that of the Louisiana, Arkansas & Texas, 416 ties, an increase of 72 per cent over 1932, this record being almost equalled by the Tennessee Central with 415 ties in 1933, or an increase of 69 per cent. An increase of 10 per cent on the St. Louis, San Francisco & Texas raised the renewal rate on that road from 164 in 1932 to 278 in 1933. The Great Northern, on the other hand reduced its renewal rate from 140 in 1932 to 40 in 1933. These figures, however, are among the exceptions. In general, most of the renewals ranged from 60 to 160 per mile of track and most of the changes in rate in 1932 and 1933 were more moderate.

While nine roads used an appreciably larger proportion of treated ties in 1933 than in 1932, there were 20 roads that applied definitely larger proportions of untreated ties than in the previous year. Outstanding among these is the Baltimore & Ohio, which increased the ratio from 1.1 per cent in 1932 to 53.3 per cent in 1933; the Atlanta, Birmingham & Coast, from 55.8 per cent to 96.1 per cent; the Spokane, Portland & Seattle, from 49.7 per cent to 95.4 per cent; and the Chicago, St. Paul, Minneapolis & Omaha, from 13.8 per cent to 52.3 per cent. However, with the exception of these 29 roads, the statistics indicate little change in policy with respect to the treatment of ties.

Statistics on Crosstie Renewals on Leading Railroads in the United States for the Calendar Year Ending December 31, 1933

ALL FIGURES ARE EXCLUSIVE OF BRIDGE AND SWITCH TIES

Road	Number of wooden crosstie renewals per mile of maintained track						Average percentage of wooden crosstie renewals	Per 5 year average	Per Cent Applied	Per Cent Applied	Weighted average gross per tie	Cost of wooden crosstie renewals in 1932 per thousand	
	1929	1930	1931	1932	1933	5 year average							
<i>New England Region:</i>													
Bangor & Aroostook	255	253	236	203	189	227	6.6	7.9	100	\$6.7	...	\$6.7	\$0.080
Boston & Maine	260	236	164	64	75	160	2.6	5.6	†	1.15	100	\$1.57	.034
Canadian National Lines in N. E.	235	160	87	57	87	125	2.8	4.0	39.8	.76	60.2	1.84	1.41
Canadian Pacific (lines in Me.)	311	320	262	181	170	249	5.9	8.6	0.5	.43	99.5	1.43	1.42
Canadian Pacific (lines in Vt.)	326	313	254	200	134	245	3.9	7.6	...	...	100	1.42	.051
Central Vermont	249	244	237	174	184	218	6.0	6.9	4.4	.55	95.6	1.63	1.58
Maine Central	204	244	222	184	167	204	5.5	6.7	56.2	.80	43.8	1.19	.97
New York Connecting	238	194	293	229	131	217	4.1	6.8	...	...	100	1.82	.023
New York, New Haven & Hartford	267	253	165	121	73	176	2.5	5.9	...	...	100	1.49	1.49
Rutland	270	224	210	189	147	208	4.9	7.0	...	...	100	1.19	.056
<i>Great Lakes Region:</i>													
Ann Arbor	202	148	114	179	130	155	4.3	5.1	...	...	100	1.48	1.48
Cambria & Indiana	†	†	†	235	348	292	12.7	10.7	96.4	.87	3.6	1.54	.90
Delaware & Hudson	201	172	111	125	139	150	4.6	4.9	5.5*	1.19	90.6	2.20	2.14
Delaware, Lackawanna & Western	84	80	76	64	53	71	1.8	2.5	5.7	.77	94.3	1.40	1.36
Detroit & Mackinac	164	202	97	126	114	141	3.8	4.7	52.3*	.46	46.0	.96	.70
Detroit & Toledo Shore Line	132	112	84	88	100	103	3.3	3.3	...	...	96.1*	1.66	1.66
Erie (Inc. Chgo. & Erie)	221	199	173	135	106	167	3.7	5.9	0.5	.63	99.5	1.45	.025
Grand Trunk Western (see note)	303	191	156	115	141	181	4.5	5.6	29.4	.85	70.6	1.45	1.27
Lehigh & Hudson River	49	66	54	55	22	49	0.9	1.9	...	...	83.4*	1.68	.009
Lehigh & New England	132	121	107	72	72	101	2.4	3.4	0.5	.63	98.5	1.86	1.84
Lehigh Valley	74	64	53	45	63	60	2.1	2.1	...	...	100	1.47	1.47
Monongahela	202	215	145	81	131	155	4.5	5.4	49.6	1.41	50.4	1.98	.070
Montour	306	259	163	95	102	185	3.6	6.6	26.0	1.01	74.0	1.76	1.56
New Jersey & New York	124	167	145	172	111	144	3.8	5.1	...	...	100	1.37	1.37

Statistics on Crosstie Renewals on Leading Railroads in the United States for the Calendar Year Ending December 31, 1933—Continued

ALL FIGURES ARE EXCLUSIVE OF BRIDGE AND SWITCH TIES

Road	Number of wooden crosstie renewals per mile of maintained track						Average percentage of wooden crosstie renewals	Per Cent	Average cost	Wooden ties untreated (U)	Wooden ties treated (T)	Weighted average per tie	Cost of wooden crosstie renewals in 1932
	1929	1930	1931	1932	1933	5 year average							
New York Central R. R. Co. (see note)	129	111	91	52	52	87	1.7	3.0	0.4*	\$1.11	96.6	\$1.58	\$1.58 \$0.015
New York, Chicago & St. Louis.	169	135	70	73	61	102	2.0	3.2	...	100	1.87	1.87	.023
New York, Ontario & Western.	134	119	116	105	90	113	3.2	4.0	1.2	55	98.8	1.19	1.19 .28
New York, Susquehanna & Western	205	174	125	112	113	146	3.9	5.2	...	100	1.34	1.34	.065
Pere Marquette	213	168	191	140	118	166	3.9	5.7	3.1	25	96.9	1.30	1.26 .050
Pittsburgh & Lake Erie.	73	62	4	5	35	36	1.2	1.2	0.1	1.58	99.9	2.14	2.14 .022
Pittsburgh & Shawmut.	322	158	159	182	218	208	7.9	7.5	87.0	70	13.0	1.83	.84 .132
Pittsburgh & West Virginia.	182	108	117	88	114	122	3.9	4.2	100	84	...	...	.84 .038
Pittsburg, Shawmut & Northern.	243	185	165	140	154	177	5.3	6.2	63.4	74	36.6	1.60	1.06 .131
Wabash	221	177	119	134	129	156	4.1	5.0	0.5	.96	99.5	1.58	1.58 .043
<i>Central Eastern Region:</i>													
Akron, Canton & Youngstown.	363	250	115	155	171	211	6.0	7.3	95.6	1.08	4.4	1.18	1.08 .123
Baltimore & Ohio (see note)	153	123	51	47	73	89	2.6	3.2	53.3	1.49	46.7	1.72	1.60 .025
Bessemer & Lake Erie.	227	231	238	171	151	204	4.8	6.5	2.2*	.83	97.0	1.77	1.75 .078
Central R. R. of New Jersey.	79	83	82	72	45	72	1.6	2.6	...	100	1.72	1.72	.017
Chicago & Eastern Illinois.	119	101	98	100	92	102	3.0	3.3	0.1	1.27	99.9	1.04	1.04 .028
Chicago & Illinois Midland.	223	126	105	112	107	135	3.5	4.5	...	100	1.07	1.07	.023
Chicago, Indianapolis & Louisville.	132	156	99	66	65	104	2.1	3.4	1.5*	.65	94.1	1.14	1.13 .022
Detroit, Toledo & Ironton.	164	149	71	90	92	113	3.2	3.9	0.2	.81	99.8	1.37	1.37 .071
Elgin, Joliet & Eastern.	269	226	165	96	124	176	4.0	5.7	...	...	97.1*	1.25	1.25 .070
Illinois Terminal	77	94	84	83	90	86	3.2	3.2	19.0	.65	81.0	1.05	.97 .050
Long Island	193	129	91	69	42	105	1.4	3.8	0.3	1.88	99.7	1.51	1.51 .009
Missouri-Illinois	260	197	221	138	183	200	5.9	6.6	0.1	.45	99.1	1.06	.45 .107
Pennsylvania R. R. (see note)	159	124	75	48	58	93	2.1	3.3	0.6*	1.22	99.2	1.68	1.68 .016
Penna-Reading Seashore Lines (see note)	104	109	114	23	4	71	0.2	2.5	...	...	100	1.94	1.94 .005
Reading Company (see note)	148	137	105	28	29	89	1.1	3.2	...	...	100	1.66	1.66 .011
Staten Island Rapid Transit	76	73	62	54	64	66	2.3	2.4	...	...	100	2.63	2.63 .049
Western Maryland	256	206	187	116	180	189	6.2	6.5	17.0	.71	83.0	1.49	1.36 .070
Wheeling & Lake Erie.	267	171	133	46	78	139	2.6	4.6	3.8	.99	91.6	1.49	1.45 .037
<i>Pocahontas Region:</i>													
Chesapeake & Ohio (see note)	211	173	127	84	92	137	3.0	4.5	...	.41	100	1.13	1.13 .013
Norfolk & Western	203	176	164	114	106	153	3.4	4.9	...	...	88.5*	1.16	1.16 .019
Richmond, Fred'burg & Potomac.	424	401	295	298	343	10.4	12.0	100*	72	...	...	.72	.31 .031
Virginian	355	342	234	169	205	261	6.6	8.3	32.2*	.64	67.6	1.31	1.10 .042
<i>Southern Region:</i>													
Alabama Great Southern	409	342	343	235	213	308	6.9	10.0	17.6	.78	82.4	1.29	1.20 .068
Atlanta & West Point	190	198	160	108	176	166	5.8	6.0	0.2	.50	99.8	1.46	1.46 .078
Western Ry. of Alabama	231	268	171	67	168	181	5.6	6.2	1.0	.85	99.0	1.41	1.40 .045
Atlanta, Birmingham & Coast	303	243	222	179	126	215	4.4	7.4	96.1	.53	3.9	1.22	.56 .045
Atlantic Coast Line	234	218	210	186	152	200	5.2	6.9	73.7	.48	26.3	.94	.60 .038
Central of Georgia	204	144	143	109	116	143	4.2	5.1	18.2	.59	81.8	.70	.68 .034
Charleston & Western Carolina	310	275	237	205	197	245	6.7	8.6	100	.80	...	...	.80 .105
Cincinnati, New Orleans & Texas Pac.	394	300	281	185	157	263	5.0	8.5	1.3	.64	98.7	1.41	1.40 .034
Clinchfield	476	477	399	376	372	420	12.2	13.8	78.2	.67	21.8	1.42	.83 .066
Columbus & Greenville	447	415	152	229	219	292	6.9	9.2	26.5	.54	73.5	.90	.80 .139
Florida East Coast	62	36	34	93	172	79	6.0	2.8	100	.50	...	.65	.50 .048
Georgia R. R.	286	250	240	178	194	230	6.3	7.6	55.8	.83	44.2	1.45	1.10 .074
Georgia & Florida	182	216	256	155	201	202	7.5	7.5	100	.47	...	.47	.44 .144
Georgia, Southern & Florida	367	247	256	153	83	221	2.7	7.1	81.6	.64	18.4	.71	.65 .026
Gulf & Ship Island	359	320	288	30	135	226	4.4	7.3	79.4	.38	20.6	.95	.50 .067
Gulf, Mobile & Northern (see note)	235	220	142	136	119	170	4.0	5.4	32.5*	.41	66.2	.81	.68 .046
Illinois Central	188	161	166	79	95	138	3.1	4.5	19.2**	.49	80.8**	1.07	.96 .023
Yazoo & Mississippi Valley	298	237	236	70	93	187	3.0	6.1	37.7	.66	62.3	1.04	.90 .046
Louisville & Nashville (see note)	235	200	168	103	109	163	3.8	5.7	10.6	.82	89.4	1.41	1.35 .036
Mississippi Central	197	204	167	96	106	154	3.4	4.9	5.1	.42	94.9	.98	.95 .100
Mobile & Ohio	368	361	287	272	230	304	7.1	9.6	100	.57	...	.57	.045
Nashville, Chattanooga & St. Louis	250	296	319	243	229	267	7.7	9.0	3.3	.41	96.7	1.05	1.03 .070
New Orleans & Northeastern	337	273	248	222	185	253	6.0	8.2	39.8	.70	60.2	1.00	.88 .046
Norfolk Southern	283	306	228	163	284	253	10.0	8.9	100	.53	...	.53	.119
Northern Alabama	437	385	351	325	375	375	11.9	11.9	100	.68	...	.68	.199
Seaboard Air Line	251	227	258	215	204	231	6.6	7.4	62.1	...	37.9	.76	.66 .052
Southern Ry.	392	351	336	298	260	327	8.2	10.3	88.7	.73	11.3	1.08	.77 .056
Tennessee Central	435	310	258	246	415	333	13.2	10.7	96.3	.60	3.7	1.75	.64 .140
<i>Northwestern Region:</i>													
Chicago & North Western	183	173	136	108	100	140	3.4	4.8	6.5	.46	93.5	1.04	1.00 .040
Chicago Great Western	205	220	243	247	179	219	6.1	7.5	27.0	.72	73.0	1.11	1.00 .047
Chicago, Milwaukee, St. Paul & Pacific	287	214	185	162	133	196	4.5	6.7	13.6	.36	86.4	1.09	.99 .052
Chicago, St. Paul, Minneapolis & Omaha	282	223	255	201	152	223	5.1	7.5	52.3	.43	47.7	1.06	.73 .041
Duluth, Missabe & Northern (see note)	225	174	160	11	38	122	1.3	4.0	35.8	.58	64.2	1.82	1.38 .038
Duluth, South Shore & Atlantic	272	235	214	157	155	207	5.3	7.0	100	.45	...	.45	.076
Duluth, Winnipeg & Pacific	386	321	246	270	298	9.0	9.9	100	.51	...	.51	.096	
Great Northern	205	190	168	140	40	149	1.2	4.7	16.5*	.34	80.1	1.03	.92 .015
Green Bay & Western	322	296	300	268	328	303	11.7	10.8	100	.61	...	.61	.171
Lake Superior & Ishpeming	250	230	150	105	148	177	4.9	5.9	100	.68	...	.68	.157
Minneapolis & St. Louis	150	122	102	101	88	113	2.9	3.7	49.0	.70	51.0	1.12	.92 .049
Minneapolis, St. Paul & S. S. Marie	238	222	173	164	169	193	5.8	6.7	51.8	.48	48.2	1.24	.84 .081
Northern Pacific	169	124	103	101	97	119	3.3	4.1	23.4	.58	76.6	1.23	1.08 .050
Oregon-Washington R. R. & Nav. Co.	198	167	98	65	84	122	2.9	4.2	1.3	.37	98.7	1.01	1.00 .040
Spokane International	356	348	326	367	263	332	9.3	11.8	100	.43	...	.43	.145
Spokane, Portland & Seattle	356	294	216	174	154	239	5.1	8.1	95.4	.44	4.6	1.30	.47 .028
<i>Central Western Region:</i>													
Alton R. R.	218	254	241	213	203	226	6.						

Statistics on Crosstie Renewals on Leading Railroads in the United States for the Calendar Year Ending December 31, 1933—Continued

ALL FIGURES ARE EXCLUSIVE OF BRIDGE AND SWITCH TIES

Road	Number of wooden crosstie renewals per mile of maintained track						Average percentage of wooden crosstie renewals			Wooden ties untreated (U)		Wooden ties treated (T)		Cost of wooden crosstie renewals in 1932 Per thousand
	1929	1930	1931	1932	1933 average	5 year	1933 average	Per Cent	Average cost	Per Cent Applied	Average cost	Weighted average gross per tie ton-miles	Weighted average gross per tie ton-miles	
Los Angeles & Salt Lake.....	167	132	124	112	137	134	4.9	4.8	0.2	\$1.21	99.8	\$1.70	.88	\$.062
Nevada Northern	183	169	133	134	117	147	4.1	5.1	100	.71	...	.71	.217	.217
Northwestern Pacific	294	270	210	106	76	191	2.6	6.5	100	.50	...	.50	.023	.023
Oregon Short Line.....	177	151	111	59	75	115	2.7	4.1	0.3	.67	99.7	1.34	1.34	.041
St. Joseph & Grand Island.....	183	126	124	69	97	120	3.3	4.0	22.5	1.23	77.5	1.86	1.72	.050
San Diego & Arizona Eastern.....	114	132	90	84	113	107	3.8	3.6	99.3*	.88	...	...	.88	.129
Southern Pacific Co.—Pacific Lines	202	164	137	97	57	131	1.9	4.5	16.1*	.68	83.8	1.05	.99	.016
Toledo, Peoria & Western.....	247	155	166	155	212	187	6.7	5.9	64.0*	.82	33.5	1.31	.99	.102
Union Pacific	162	123	108	85	86	113	3.1	4.0	0.1	.96	99.9	1.34	1.34	.021
Utah Ry.	201	234	187	110	94	165	3.6	6.3	48.5	.57	51.5	1.89	1.25	.046
Western Pacific	426	338	261	199	277	300	9.5	10.3	100	.59	...	1.00	.59	.044
<i>Southwestern Region:</i>														
Burlington-Rock Island	246	400	145	22	27	168	0.9	5.4	...	...	100	.62	.62	.010
Forth Smith & Western.....	342	311	241	254	203	270	6.6	8.6	100	.46	...	.46	.098	.098
Forth Worth & Rio Grande.....	426	153	118	156	228	216	7.2	6.8	89.3	.78	10.7	1.24	.83	.214
Gulf Coast Lines:														
Beaumont, Sour Lake & Western	219	216	115	58	76	137	2.5	4.6	...	...	100	1.09	1.09	
New Orleans, Texas & Mexico	240	224	126	93	113	159	3.7	5.2	...	...	100	1.09	1.09	
St. Louis, Brownsville & Mexico	184	158	60	28	30	92	1.0	3.0	3.6*	.28	96.3	1.04	1.04	.030
San Antonio, Uvalde & Gulf	241	240	225	132	94	186	3.3	6.5	...	...	100	1.15	1.15	
Gulf, Colorado & Santa Fe.....	205	191	125	59	64	129	2.0	4.0	2.4	.39	97.6	1.04	1.02	.030
International-Great Northern.....	214	204	167	93	123	160	4.1	5.3	0.5	.52	99.5	.91	.91	.030
Kansas City Southern.....	157	169	146	151	126	150	4.0	4.8	†	.38	100	1.01	1.01	
Texarkana & Fort Smith.....	117	140	156	90	84	117	2.7	3.8	...	...	100	1.05	1.05	.046
Kansas, Oklahoma & Gulf.....	112	117	107	92	137	113	4.3	3.6	0.4	.38	99.6	.98	.98	.076
Louisiana, Arkansas & Texas.....	303	339	253	184	251	266	8.0	8.4	66.3	.55	33.7	.88	.67	.088
Midland Valley.....	208	165	112	76	94	131	2.9	4.1	0.2	.30	99.8	1.05	1.05	.114
Missouri & North Arkansas.....	326	250	240	178	216	242	7.0	8.0	100	.42	...	.42	.42	.088
Missouri-Kansas-Texas Lines:														
Missouri-Kansas-Texas.....	201	168	98	129	96	138	3.1	4.4	36.4	.75	63.6	1.28	1.09	
Missouri-Kansas-Texas of Texas	234	152	87	108	103	137	3.2	4.3	35.6	.73	64.4	1.28	1.09	.035
Missouri Pacific	294	217	164	96	164	187	5.3	6.0	11.6	.58	88.4	.90	.86	.039
Oklahoma City-Ada-Atoka.....	b	404	108	97	42	163	1.3	5.2	70.9	.37	29.1	1.47	.69	.056
St. Louis-San Francisco.....	204	168	124	167	204	173	6.5	5.6	13.8	.52	86.2	.99	.92	.078
St. Louis, San Francisco & Texas.....	334	149	133	164	278	212	8.8	6.7	81.0	.72	19.0	1.29	.83	.183
St. Louis Southwestern Lines:														
St. Louis Southwestern.....	332	260	90	75	52	162	1.6	5.1	1.9*	.49	95.4	1.19	1.17	
St. Louis Southwestern of Texas	348	148	95	81	62	147	2.0	4.7	0.2*	.63	97.2	1.19	1.19	.026
Texas & New Orleans.....	222	173	139	99	87	144	3.2	5.3	14.5	.97	85.5	.87	.88	.035
Texas & Pacific.....	297	170	107	54	69	139	2.4	4.5	0.1	.36	99.9	.95	.95	.018
Texas Mexican.....	302	269	184	152	124	206	4.3	7.2	...	...	96.7*	.99	.99	.155
Wichita Falls & Southern.....	215	247	224	176	158	204	4.8	6.2	...	...	100	.94	.94	.257
<i>Canadian Roads:</i>														
Canadian National (see note).....	...	...	...	...	164	198	5.7	7.0	53.7	.48	46.3	1.26	.84	.076
Canadian Pacific (see note).....	...	...	...	...	161	198	5.6	7.0	40.9	.54	59.1	1.35	1.02	.079
Temiskaming & Nor. Ontario.....	...	...	...	...	216	235	7.5	8.1	100	.71	...	...	.71	

* Owing to the fact that the total ties renewed by a few roads included some second hand, steel or narrow-gage ties, the percentages of treated and untreated ties do not total 100 per cent in all cases.

** Include second-hand ties.

† Proportion is less than one-tenth of one per cent.

NOTE: Statement applies to Class I roads and includes consolidated data for Class I roads merged during the period 1929 to 1933, as follows:

Baltimore & Ohio—includes Buffalo, Rochester & Pittsburgh and Buffalo & Susquehanna.

Grand Trunk Western—includes Chicago, Detroit & Canada Grand Trunk Junction and the Detroit, Grand Haven & Milwaukee.

New York Central—includes Evansville, Indpls. & Terre Haute; Cincinnati Northern; Cleveland, Cincinnati, Chicago & St. Louis; Michigan Central, and Ulster & Delaware.

Pennsylvania—includes West Jersey & Seashore up to and including 1932.

Penna.-Reading Seashore Lines—includes Atlantic City and West Jersey & Seashore; organized as Class I road in 1933. Figures shown are for Atlantic City R. R. only, 1929-1932 inclusive.

Reading Company—includes Perkiomen and the Port Reading.

Chesapeake & Ohio—includes Hocking Valley.

Gulf, Mobile & Northern—includes New Orleans Great Northern.

Louisville & Nashville—includes Louisville, Henderson & St. Louis.

Duluth, Missabe & Northern—includes Duluth & Iron Range.

Atchison, Topeka & Santa Fe—includes Kansas City, Mexico & Orient.

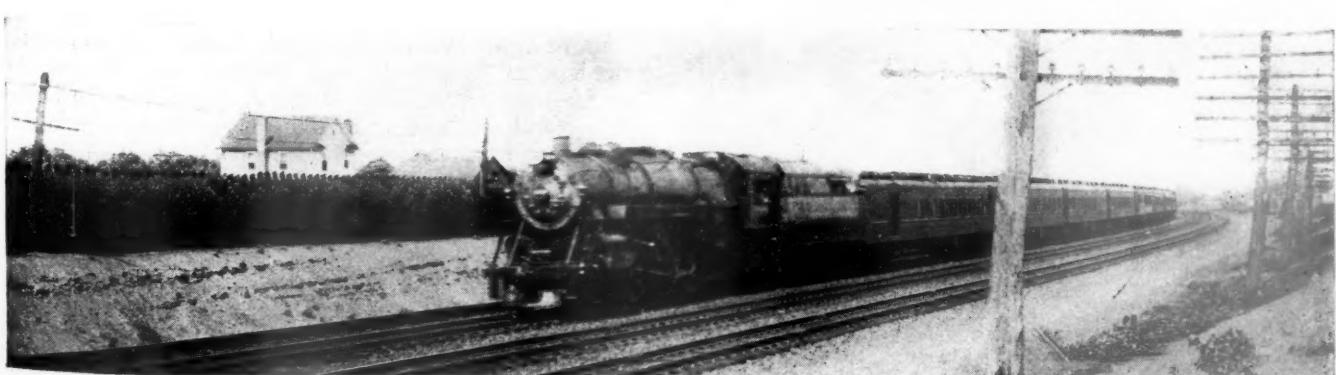
Panhandle & Santa Fe—includes Kansas City, Mexico & Orient of Texas.

Louisiana & Arkansas—includes Louisiana Ry. & Navigation Company.

Canadian National Rys.—includes lines in New England, Grand Trunk Western, and Duluth, Winnipeg & Pacific.

Canadian Pacific—includes all lines.

* * *

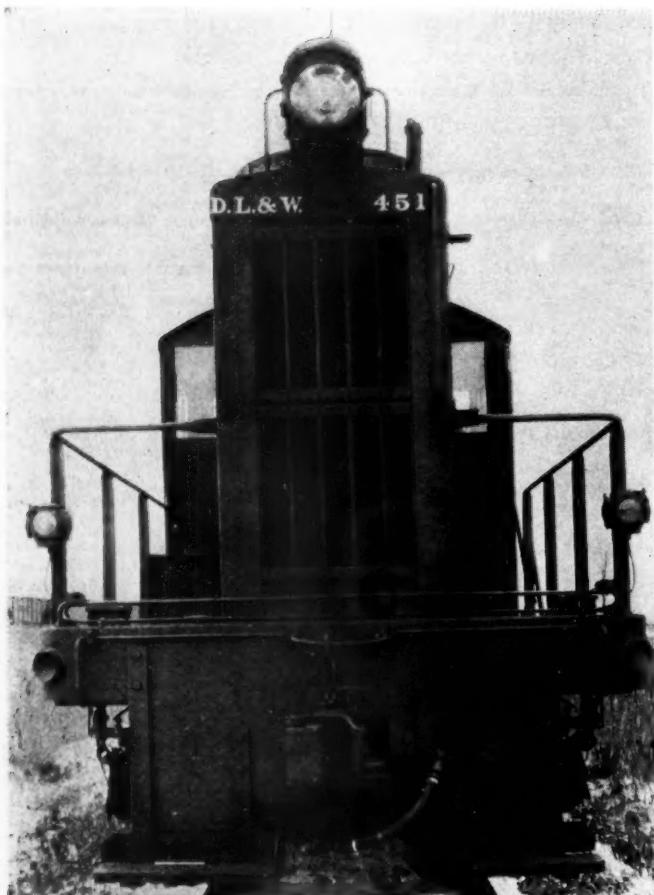


A Baltimore & Ohio Train on the Central of New Jersey near Bound Brook, N. J.



The Locomotive Is Powered by Two 300-Hp. Ingersoll-Rand Engines

Oil-Electric 600 Hp. Switchers for the Lackawanna



The Narrow Cowl Permits Good Visibility Ahead

OUR 600-hp. Diesel-electric locomotives were delivered in the latter part of 1933 and the early part of 1934 to the Delaware, Lackawanna & Western by the General Electric Company. Three of these locomotives, each of which is equipped with two 300-hp. Ingersoll-Rand engines, have been placed in freight and passenger switching service at Buffalo, and one in switching service at Binghamton, N. Y. Two more locomotives of the same type are now under construction for the same railroad.

The speed-tractive-force characteristics are shown in the diagram, which also shows the hourly and continuous ratings of the equipment. The tractive force at 25 per cent adhesion is 51,000 lb. The maximum permissible speed is 40 miles an hour.

General Design

The locomotive has the operating cab in the middle and is of the type sometimes called "steeple cab" design. There are two two-axle equalized swivel trucks, the frame being of integral cast steel. There are two brake cylinders on each truck, one on each side, directly in line with the brake shoes, thereby simplifying the brake rigging and eliminating all underframe brake rigging.

The underframe is of welded construction made entirely of structural shapes and plates with the exception of the center plates which are of cast steel, but these are also welded into place. The backbone of the frame consists of two $13\frac{1}{4}$ in., 126-lb. per ft. H-beam sections so spaced as to accommodate the engine bolting. The space between these beams is used for a fuel oil tank having 400 gallons capacity.

The locomotive is especially suitable for switching service because it affords excellent visibility forward, to the side, and to the rear. The visibility forward is illus-

68,000
64,000
60,000
56,000
52,000
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44,000
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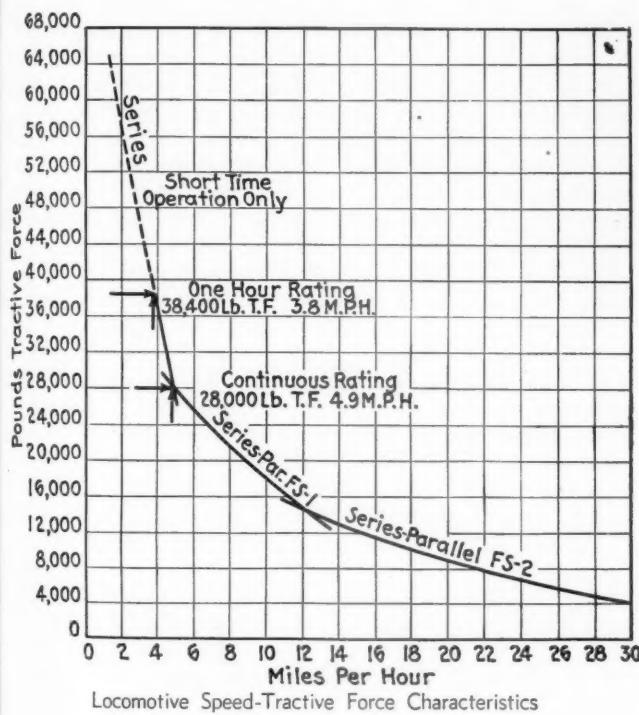
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Locomotives are featured by increased visibility and improved control—One or both of two engines may be used

By F. H. Brehob

Locomotive Division,
Transportation Engineering Department,
General Electric Company, Erie, Pa.

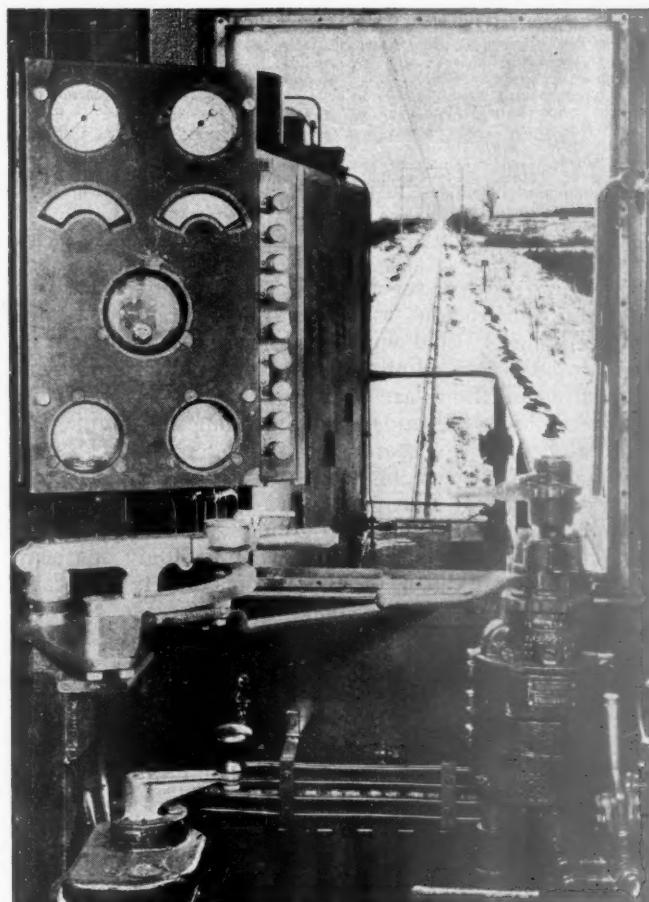


trated by the photograph taken from a position at the operator's control station. The view backwards through a window in the door is practically as good.

The engines are located inside the end cabs with the generator towards the middle extending into the operator's cab. The operator's cab floor is built about 2 ft. above the top of the frame to provide room for apparatus below and to raise the operator for improved visibility.

There is a traction motor blower set at each end immediately ahead of the engines to ventilate the traction motors through the center plate and truck transom.

The space between the top of the frame and the operating cab floor is used for the control equipment. This is arranged in two groups, the main control on one side and the auxiliary control on the other, accessible from the inside by means of trap doors in the cab floor and from the outside by drop doors from the outside of the cab. This arrangement places the control apparatus near the source of electrical power, and also near the



One of the Control Positions

operator's stations, a desirable feature since it reduces lengths of cables to a minimum.

A cabinet housing the voltage regulators for the auxiliary generators and other relays is mounted in the main cab against one bulkhead so that these devices are conveniently accessible from inside the main cab. The air compressors and air reservoirs are supported from the underside of the frame.

The engine cooling radiators, consisting of sections for cooling water and oil, are mounted in the ends of the auxiliary cabs and are ventilated by a motor-driven propeller-type fan at the top of the auxiliary cab, so arranged that the air is drawn in through the radiators by the fan and exhausted upward. Arranging the radiators in sections permits the replacement of any one section in case of failure with a minimum loss of time and at a small expense. A 60-gallon water storage tank to supply leakage and make-up for the engine cooling system is located above the radiator which also serves as a header for the radiator sections. The cooling fan exhausts the air through a vertical hole, through the tank. The location of the radiators near the engine reduces the water piping to a minimum. Wall-type radiators heat the operator's cab, utilizing the engine-cooling water. There are only two valves in each engine water circulating system, one for the cab radiators and one for draining the system.

Equipment

The engines were built by Ingersoll-Rand and are of the 6-cylinder vertical four-stroke cycle type with 10-in. bore by 12-in. stroke, having a nominal rating of 300 hp. at 550 r.p.m. This engine has been used for a number

Principal Weights and Dimensions

Weight light	198,000 lb.
Weight in running order.....	204,000 lb.
Weight on drivers.....	204,000 lb.
Weight per driving axle.....	51,000 lb.
Length inside knuckles.....	.45 ft. 0 in.
Height overall	14 ft. 4½ in.
Width overall	10 ft. 8½ in.
Total wheel	32 ft. 6 in.
Rigid wheel base.....	8 ft. 0 in.
Wheel diameter—rolled steel.....	40 in.
Minimum radius of curvature.....	125 ft.

of years in railroad service and a large number are now operating on various railroads in the United States. Each engine is fitted with exhaust mufflers and air intake strainers located on the roof. Fuel oil strainers and lubricating oil filters are also provided.

Direct connected and overhung from the engine is a General Electric generator for traction power, classified GDT-515, and overhung from this generator is an auxiliary generator. The generators are connected to the engine by a flexible disc coupling so arranged as to carry a portion of the armature weight. Only one bearing is used and this is of the anti-friction type, located between the main and auxiliary generators.

The main generator is inherently regulated for locomotive load conditions by means of a combination of a separately excited shunt field, a self-excited shunt field and a series differential field so that the operator controls the power supply merely by engine speed.

There are four single geared commutating pole-type traction motors, classified GE-287. They are supported on the truck axles to maintain the gear and pinion alignment and also on the truck transom by means of a motor nose on spring supports. All motor bearings are of the sleeve-type lubricated by waste and oil. This motor has been specially designed for switching service, the motor losses being relatively low per kilowatt power input, especially at high tractive forces.

There are two 50-cu. ft. displacement, 2-stage air compressors separately receiving power from the two auxiliary generators. These compressors are designed for a discharge pressure on the high pressure side of 135 lb. per sq. in., which makes the locomotive suitable for passenger-car switching where a 110-lb. brake pipe is used.

The air brake equipment is the Type 14-EL specially designed for locomotives with two operating stations. There are two bracket-type K-14 brake valves and one No. 14 distributing valve. The main cab is fitted with two control stations on diagonally opposite corners with complete control equipment at each end.

The engines are started by motorizing the main generator from a 56-cell storage battery. This is accomplished by a pushbutton control at each operator's position. If the work is light so that it can be done with one engine generator set, the locomotive may be so operated by starting only one engine.

These locomotives are the first to use a newly developed voltage control relay which holds constant voltage on the auxiliary generators from idling speed to full speed and for varying load conditions. It is desirable to hold a constant auxiliary voltage to keep the battery on charge at all times when either engine is running and to have 100 per cent compressor capacity at all times. This new device has a series of fingers operated by an element which moves up or down. The fingers being permanently connected to resistors change the field excitation to suit, depending upon the number of fingers making contact with a conductor on the relay moving element.

The speed of the locomotive is controlled by a manually-operated throttle actuating the engine governor, controlling the engine speed. The direction of move-

ment is governed from the master controller. The motors are arranged for series operation in low speed, and are then automatically changed by a voltage relay to series-parallel. An additional higher running speed is then made possible by shunting the fields of the traction motors automatically. The operator can forestall the higher running speed by setting his electrical controller on the series position or series-parallel position.

The engineman has control of the water temperature by means of switches at the operator's station so that the fans may be operated in series at reduced ventilation, full speed for maximum ventilation, or entirely shut down when the weather is cool and the locomotive duty light. For cold weather operation covers are provided for the radiators.

Short Lines Meet

FREIGHT rate increases, increasing government control, pensions and legislation were considered and resolutions pertaining thereto passed at the twentieth annual meeting of the American Short Line Railroad Association at Milwaukee, Wis., on August 6 and 7. The association voted to join Class I carriers in their efforts to secure increases in freight rates, to oppose government control of railways, and to intervene in the suit of the Class I railways attacking the constitutionality of the Railroad Pension Act. The association also agreed to assist in urging the seventy-fourth Congress to enact legislation covering the federal regulation of interstate transportation by motor trucks and buses, the regulation of water carriers, the modification of the fourth section of the Interstate Commerce Act and of section 204 of the Transportation Act of 1920 pertaining to deficits in railway operating income.

Judge R. V. Fletcher, vice-chairman and general counsel of the Association of Railway Executives, who was the principal speaker at a luncheon on August 6, declared that the railroads must participate in politics if they are to protect themselves.

W. L. White, president, R. E. Schindler, secretary-treasurer, C. A. Miller, general counsel, J. P. Blanton, traffic manager at Atlanta, Ga., and E. W. Dozier, traffic manager at Washington, D. C., were re-elected. Of the regional vice-presidents, J. M. Hood, chief operating officer of the Akron, Canton & Youngstown, was elected to succeed F. J. Lisman, while C. W. Pidcock, vice-president, treasurer and general manager of the Georgia Northern, C. C. Cary, vice-president and general manager of the Sabine & Neches Valley, J. Fred Sheehy, president and general manager of the Chicago Short Line, and C. M. Oddie, were re-elected.

New Constitution

On June 22, 1934, a new constitution was adopted by the association. It changes the name of the executive board to the board of directors and provides for the election of regional vice-presidents and members of the board of directors by the members of each region independent of other regions. The control of the affairs and business of the association is vested in the board of directors which elects the officers and prescribes their duties and fixes their compensation. The board is required to meet at least once every four months. In the interim it acts through an executive committee consisting of the president and the regional vice-presidents. The officers elected by the board hold office at the pleasure of the board.

Railroads Contest Pension Law

Bill of complaint filed in Supreme Court of District of Columbia—
Temporary order denied

ASserting that the railroad retirement act which became effective on August 1 "discloses on its face that it is experimentation at the expense of the plaintiffs," a committee of counsel representing the principal railroads of the country, the Pullman Company, and the express companies, on August 13 filed in the supreme court of the District of Columbia a bill of complaint assailing the act as unconstitutional and invalid and asking an injunction to restrain the Railroad Retirement Board from taking any steps to enforce it. Further proceedings were postponed by the court until Wednesday, with the understanding that the board would not issue any orders under the law until after a hearing on the railroads' application for a temporary restraining order.

On Wednesday Judge Proctor declined to issue a temporary order after he had been informed that the board intended immediately only to call upon the railroads for an advance payment of one-tenth of one per cent of the amount of the July payrolls, estimated at about \$125,000, and for the names of employees who would reach the age of 70 before next February. He said that a temporary order could be made for only ten days and that there was no showing of great injury to the railroads, since the board was within the jurisdiction of the court and if the board should issue further orders the roads could apply to the court at any time. No date was set for a hearing on the question of a permanent injunction but the judge said that every effort would be made to expedite a final determination of the case. Later in the day the board issued an order calling on the railroads for advance contributions of one-tenth per cent of July compensation to be paid by August 25.

Emphasis was placed in the bill not only on the fact that the law singles out the railroads from all industry for the application of such legislation but also on the fact that it suddenly calls on the railroads to pension many thousands of their employees years before they would be eligible for retirement under the existing voluntary pension systems, even including men between 51 and 65 years of age if they so elect, to pave the way for the employment of younger men who have been laid off, without any prior accumulation of funds for the purpose and in a year when 33 of the roads failed to earn operating expenses and taxes in the first six months.

Charging that Congress by the act exceeded its powers under the commerce clause of the Constitution, because its provisions have no reasonable relation to interstate commerce, and that the law is in violation of the Fifth Amendment to the Constitution in that it arbitrarily deprives plaintiffs of property and liberty of contract without due process of law, the bill asked that the Retirement Board and its members individually be restrained and enjoined, both temporarily pending the suit and permanently at the final hearing, "from making any order and from instituting or taking any steps towards the institution of any actions, proceedings or prosecutions designed to compel plaintiffs or their officers, or any of them, to make any advance payment or other

payment required by the act, or to compel them to assemble, compile or furnish any of the information and records required, or which may be required, to be furnished under the act, or to compel them to change their existing relations with any of their employees, or in any wise to put plaintiffs in a worse position with respect to any of the matters here involved." The railroads also prayed that each and every provision of the law be declared void and of no effect.

Determination to contest the constitutionality of the railroad retirement act was reached by the railroads at a meeting in Atlantic City in July and the matter has been in the hands of a committee consisting of Sydney R. Prince, vice-president and general counsel of the Southern; R. V. Fletcher, general counsel of the Association of Railway Executives; Jacob Aronson, vice-president of the New York Central; Edward S. Jouett, vice-president and general counsel of the Louisville & Nashville; Dennis F. Lyons, general counsel of the Northern Pacific; and Emmett E. McInnis, general counsel of the Atchison, Topeka & Santa Fe.

Conferences had been held with the Railroad Retirement Board with the idea of adopting an orderly procedure for bringing about a court test of the law and it had been expected that the suit would be filed after the board had issued an order calling on the railroads for the payment of an advance contribution toward the pension fund, which is also to bear the administrative expenses of the board and of the investigation it was directed to make with a view to the adoption of a more permanent pension plan. The board, however, instead of issuing such an order, had asked the railroads for an informal advance contribution of \$300,000 for its expenses and the railroads decided to ask for an injunction without awaiting an order. The bill was presented to Judge Proctor by Mr. Prince but the case was postponed until Wednesday because Paul Williams, special assistant to the Attorney General explained that the representative of the Department of Justice familiar with the matter was out of the city.

Singling Out of Railroads Called Arbitrary

The railroads contend that "the selection of carriers' employees as the beneficiaries of a compulsory system payable by the carriers is beyond the power of Congress, is arbitrary and deprives plaintiffs and each of them of their property without due process of law and imposes upon plaintiffs a burden which, if it exists at all, should be borne by society as a whole," and they particularly object to the pooling provisions of the law under which the railroads as a whole are treated as a unit for the administration of the pension system.

It was pointed out that unless relief be found in equity and in the injunctive process of the court, there would result a multiplicity of suits against the railroads and of prosecutions of their officers and agents and that they could not safely comply with the requirements of the act that they pay into the Treasury of the United States either the 2 per cent contribution to be deducted from the pay of the employees, amounting to not less than

\$30,000,000 the first year, or the contributions required of the railroads, amounting to not less than \$60,000,000 the first year, because they would be without adequate remedy to recover if the act should thereafter be adjudged invalid.

Several paragraphs are inserted to show the present serious financial condition of the railroads and that the obligation to contribute approximately \$60,000,000 during the first year "unreasonably and unnecessarily diminishes their capacity to furnish adequate, safe, and efficient transportation service, and in no wise promotes the safety or efficiency of interstate commerce."

The point is made that approximately 20 per cent of all the commercial freight traffic and approximately 35 per cent of the commercial passenger traffic in the United States is now conducted by motor carriers or water carriers or other competing agencies, and practically all freight and passenger traffic, except certain heavy freight moving in car lots, is the subject of active competition among the various forms of transportation. "By reason of these competitive conditions," it is declared "impossible for plaintiffs to obtain through increased rates or increased volume of traffic sufficient additional revenue to meet the contributions required by the act in addition to the other increases in operating expenses." Reference is made to the increase in wages, estimated at more than \$165,000,000 a year, and to the increase of \$125,000,000 a year in prices of materials and supplies, while the net railway operating income of the Class I roads for 1934 is estimated at substantially less than for 1933.

The claim that the act is invalid is based on the following, among other reasons:

Grounds for the Claim of Invalidity

1. Congress by the act exceeded its powers under the commerce clause of the Constitution because the provisions thereof have no reasonable relation to the promotion of efficiency or safety of interstate transportation; because the means it prescribes therefor are unreasonable and arbitrary; and because it applies to all employees, including those not engaged in any commerce, those engaged exclusively in intrastate commerce, and those not engaged in interstate commerce or work so closely related thereto as to warrant regulation in order to promote efficiency or safety of interstate transportation, and also applies to certain persons not employees.

2. Congress by the act exceeded its power derived from the commerce clause of the Constitution because while the act, in Section 2, states as one of its purposes the promotion of "efficiency and safety in interstate transportation," its real ends and aims, expressly declared in the same section, and by the whole act, are to provide for "satisfactory retirement of aged employees," and to "make possible greater employment opportunity and more rapid advancement of employees in the service of carriers"; and the act itself requires that it be so administered and construed, in the following words:

"This act shall be administered and construed with the intent and to the purpose of providing the greatest practicable amount of relief from unemployment and the greatest possible use of resources available for said purpose and for the payment of annuities for the relief of superannuated employees."—

none of which ends and aims is within any power delegated to Congress by the Constitution.

3. The act unlawfully imposes upon plaintiffs and each of them the obligation to pay large sums of money into the treasury of the United States as contributions to a common fund for the payment of annuities to their employees from the time of their retirement until death; unlawfully interferes with management; unlawfully classifies and discriminates against plaintiffs; and prescribes other arbitrary and unreasonable requirements. It thereby deprives plaintiffs and each of them of their property and liberty of contract without due process of law and takes their property without just compensation, all in violation of the Fifth Amendment to the Constitution.

4. The act discloses on its face that it is experimentation at the expense of plaintiffs; furthermore, it authorizes the board to require of plaintiffs contributions for administration and research, and without limiting the amount—all in violation of the Fifth Amendment.

The facts with reference to employees who are not

engaged in interstate commerce and persons who are not employees of the plaintiffs or any other carriers, but in each case are nevertheless beneficiaries under the act, are stated in part as follows:

1. Many of the persons in plaintiffs' employ do no work in the interstate commerce conducted by plaintiffs, and no work so closely connected therewith as to be a part thereof or to be within the regulatory power of Congress under the commerce clause. The services of such persons are confined wholly to executive duties or to work relating to finances, custody or administration of securities or funds, corporate proceedings or corporate records, taxes, titles, experimentation, research, claims, litigation, accounting, advertising, industrial development and traffic solicitation; or work relating to the management, operation, care or protection of buildings and lands not devoted to or used in connection with transportation; or work relating to the construction of buildings and lines of railway, the construction of new equipment, or the reconstruction or major repair of other equipment withdrawn from transportation service; and office and clerical assistance in connection with the work above described. The exact number of those so engaged varies, but in the aggregate the number is not less than 200,000, or approximately one-fifth of all the employees of plaintiffs. The amount of wages paid to such employees is not less than \$300,000,000 annually. In addition, large numbers of plaintiffs' employees are engaged exclusively in intrastate commerce.

Under the act plaintiffs are required to make contributions to the Railroad Retirement Fund based on the compensation paid by them to the persons above described, and such persons become eligible to annuities as provided by the act, in the same manner as persons engaged in the interstate commerce conducted by plaintiffs.

2. There are in the employ of plaintiffs more than 9,500 persons of age 70 or more whom Section 4 of the act itself will require to leave the service of plaintiffs permanently February 1, 1935. They will contribute less than \$250,000 to the fund but will receive therefrom as a bounty for past service not less than \$9,000,000 the first year and not less than \$74,000,000 to termination of annuities, two-thirds of which will be required to be paid by the carriers.

3. Within one year before the approval of the act more than 50,000 of plaintiff's employees left carrier service and have not returned to it. At the time the act was approved such persons were not, and since then have not been, employees of any carrier or connected in any way with any business conducted by the carriers. Under the act, as plaintiffs are advised and charge the act is construed and is about to be enforced by defendants, plaintiffs are required to contribute to annuities for such persons.

4. Plaintiffs have in their employ approximately one million persons and during times of normal industrial conditions had and will have a much larger number. There are frequent changes in personnel. Under sections 3 and 5 of the act, as plaintiffs are advised and charge the act is construed and is about to be enforced by defendants, plaintiffs are required to contribute to annuities for all persons who, subsequent to its enactment, are in carrier service and shall leave such service at any age whatever and with any service period whatever, which annuities are not payable until such persons respectively reach 65 years of age, but are payable then and thereafter regardless of how long such persons at that time shall have been entirely out of such service.

5. In the orderly conduct of the business of transportation it is necessary from time to time to release from their service employees found to be detrimental to its efficiency or safety. It is not practicable to state the number of employees so released from service annually by each of the plaintiffs, but the number in the aggregate is approximately 5,000 persons. Under the act, as plaintiffs are advised and charge the act is construed and is about to be enforced by defendants, plaintiffs are required to contribute to annuities for persons so released from service, payable when they reach 65 years of age, without regard to the unsatisfactory nature of their service which made their release necessary.

Plaintiffs expressly deny the correctness of the construction of the act adopted by defendants as set forth in foregoing paragraphs numbered 3, 4 and 5, and aver that the act, properly construed, does not make eligible for annuities the persons referred to in those paragraphs. But because of this conflict of opinion concerning the meaning of the act, it is necessary for the protection of plaintiffs' rights that they present to this court the facts stated in said paragraphs 3, 4 and 5, in order to show the application of the act to such persons if the construction of the defendants be correct.

As set forth in foregoing paragraphs 1 to 5, the act includes subjects beyond the power of Congress under the commerce clause by extending its benefits to persons who have no opportunity to add to the efficiency or safety of interstate transportation, and is unreasonable and arbitrary.

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Other points made in the bill are as follows:

1. The relationship between each plaintiff and each person in its employ consists of a contract of employment freely and fairly made, by which the work to be done and the compensation to be paid therefor were agreed upon and fixed, and by which the employer is required to pay such wages and no more. Sections 3 and 5 of the act, require each plaintiff, through the Railroad Retirement Fund, to pay additional sums, not contracted for, to each employee when he reaches age sixty-five or when he completes thirty years service, if he so demands and leaves the service, and to make like payments to him monthly throughout the remainder of his life; and the act prevents plaintiffs from employing any person in the future for any purpose, except on condition that, in addition to the contractual obligation for agreed wages, they assume the further obligation to pay him annuities as provided by the act.

The amount which each plaintiff thus will be required to pay through the Railroad Retirement Fund to its employees and to the employees of the other plaintiffs cannot be ascertained, but it will be many thousands of dollars annually in the case of each plaintiff, and for all the plaintiffs it will be not less than \$60,000,000 for the first year based upon the present payrolls of plaintiffs and the 4 per cent rate fixed by the act, and the amount will increase year by year for many years.

2. The obligation imposed upon plaintiffs to contribute to the payment of annuities to persons who have ceased or shall cease to work for them is dependent solely upon their having attained a specified age or having performed thirty years service. The employees of plaintiffs have no peculiarity of age, physical or mental condition, or other characteristic distinguishing them from members of society generally. The selection of carriers' employees as the beneficiaries of a compulsory pension system payable by the carriers is beyond the power of Congress, is arbitrary and deprives plaintiffs and each of them of their property without due process of law and imposes upon plaintiffs a burden which, if it exists at all, should be borne by society as a whole.

1. Section 3 provides for annuities for employees who have a service period of more than thirty years and are between 51 and 65 years of age. Each of the plaintiffs now has and will always have a large number of such employees who are competent to continue their service. The aggregate number of such employees at the time of approval of the act was not less than 100,000. It is desirable in the public interest that these trained and experienced persons remain in the carrier service. Their right to such annuities depends solely upon the demand of such employees, and the right so to demand does not take into account or depend upon the character of service in which they are engaged, their fitness for further service, or the public need for their continuance in carrier service.

2. Each of plaintiffs now has and always will have a large number of executives, officials and expert employees who possess valuable special knowledge and qualifications which are the result of many years of study and practical experience. Their training and experience are of much value to the plaintiffs and to the public.

Discriminatory Features of the Law

Except in certain instances of joint operation involving merely incidental use of a small number of joint employees, no employee of any plaintiff is in the employment of the other plaintiffs or any of them, and the business conducted by each plaintiff is separate and distinct from that conducted by the others and each of them. Facts showing the mingling and pooling of their affairs and funds and the service periods of their employees under the act are as follows:

1. There are now in the employment of plaintiffs, as hereinbefore shown, more than 9,500 men, other than those occupying official positions, who at the time of the approval of the act had reached the age of seventy and who therefore, under Section 4 of the act, must be retired February 1, 1935, with annuities. Their average annual annuity will be approximately \$1,000 and the aggregate amount which will be paid to them during the first year will be approximately \$9,000,000. Upon established actuarial principles the gross sum that will be paid to them to termination of annuities will be approximately \$74,000,000. All of the employees herein referred to are employees of 81 of the plaintiffs; the remaining 56 of the plaintiffs have no such employees but employ 37 per cent of all persons employed by all the plaintiffs. The 56 plaintiffs which have no such employees under the act will be required to contribute approximately \$2,200,000 during the first year and approximately \$19,000,000 to termination for annuities of such employees of the 81 carriers. Likewise, there is a wide variance among the several carriers in percentage and number of employees of other age classifications and a wide variance in respect to the past service periods of their respective employees. The contribution of each plaintiff to the pool will not depend upon the age char-

acteristics or service periods of its own employees, but upon the fortuitous facts in these respects concerning the employees of all the carriers.

2. By the terms of Section 1(b) of the act persons in carrier service before but not after June 27, 1933, are ineligible for annuities, but service after that date creates eligibility for annuities, based not alone on the subsequent service, but on the prior service as well. There are more than 1,000,000 persons with such prior service but without such subsequent service. There are at least 700 carriers subject to the act. By reason of the provisions in Section 1(f) of the act for pooling service periods, each of these ex-employees, by procuring employment with any carrier, without the knowledge or consent of the others, will receive for his past carrier service not otherwise pensionable, an annuity commencing when he reaches age 65, payable from the common fund.

3. In the ordinary course of railroad business a number of carriers cease operation each year. Persons retired from the service of carriers which hereafter shall cease to exist or which for any other reason shall cease to contribute will continue nevertheless to be eligible for annuities payable from the Retirement Fund to which the remaining carriers must contribute.

4. There are not less than 1,500 officers or other official representatives of railway labor unions who are not now performing any service for the carriers but who are duly designated and authorized to represent employees under the Railway Labor Act. Their average age is greater than the average age of carrier employees. A substantial portion of their annuities, the exact amount of which cannot be computed, will be paid by the carriers because under Sections 1(b) and 7 of the act the service of such persons for carriers is pooled with their service for labor organizations as a basis for their annuities, their contributions and the contributions of carriers are paid into the common Railway Retirement Fund and their participation in the retirement system is not compulsory but depends on their election.

By reason of the facts set forth in the foregoing paragraphs 1 to 4, the act and particularly its pooling provisions are arbitrary and unreasonable and deprive plaintiffs and each of them of their property without due process of law.

In so far as the act includes in the basis for annuities service rendered prior to the approval of the act, it has no relation to future interstate commerce but arbitrarily and unlawfully operates only on past services and events. Practically all of the persons in the employ of each of the plaintiffs at the time of the approval of the act, were in the employ of such plaintiffs or of other carriers, defined in the act, at times and for periods prior thereto. Such times and periods of prior employment vary greatly and it is impracticable to ascertain, as to each such person, the exact period of such prior employment with any carrier, but as to the majority of such persons, the prior employment embraces many years. Said prior employments are, and at the time of the approval of the act were, closed and completed transactions.

Immediately upon the approval of the act, and solely by reason thereof, there came into existence and was imposed upon plaintiffs and each of them an obligation in respect of such past services of carrier employees which, exclusive of any subsequent service periods, under established actuarial principles, will amount in the aggregate to hundreds of millions of dollars.

Grounds for Court Interposition

As grounds for the interposition of a court of equity and for the relief herein sought, plaintiffs state:

By the terms of the act defendants are required, and they are asserting authority, to exercise all the duties and powers necessary to administer the act, and to take such steps and institute and prosecute such proceedings and actions as may be necessary to enforce it. This they threaten to do and, unless enjoined, they will issue orders and commence proceedings, in the courts and otherwise, against the plaintiffs, and each of them, to compel their obedience to various provisions of the act. Defendants intend and threaten forthwith, pursuant to Section 9 of the act, to demand from plaintiffs and to order them to pay immediately into the treasury of the United States large sums of money as advances upon the payments which the act provides shall be made by carriers. Defendants also intend and threaten forthwith to order plaintiffs to furnish a great mass of statistical data that can only be prepared and furnished by plaintiffs at large cost to them. Defendants further intend and threaten to set up forthwith large clerical, accounting and administrative forces in order to establish and maintain separate accounts for each of the more than one million employees and former employees of plaintiffs who come within the provisions of the act, all at great cost to these plaintiffs.

The defendants also threaten to assess and enforce against each of the plaintiffs a penalty of one per cent for each month it shall delay the payment of any amount required to be paid

by it under the act. Such assessments and penalties will be recurring because such payments must be made quarterly, or at such other times as ordered by the board.

By reason of the heavy penalties and punishments imposed by the act, and the repeated charges of violation which would be involved, plaintiffs cannot safely disregard the act or cause or induce their respective officers and agents to disregard it.

If plaintiffs make deductions from the wages of their employees and pay the same into the treasury of the United States, as required by the act, and the act thereafter be adjudged invalid, they will be forced to repay to their employees the amounts so deducted, or will be subjected to a multiplicity of suits by their respective employees to recover such deductions. Plaintiffs cannot safely comply with the requirements of the act that they pay into the treasury of the United States either such funds so deducted, which would amount to not less than \$30,000,000 the first year, or the contributions required of plaintiffs, which would amount to not less than \$60,000,000 the first year, because plaintiffs, and each of them, would be without adequate remedy to recover the same.

The defendants have not prescribed any rules and regulations under Section 6 of the act, or taken any action or threatened to take any action thereunder. Plaintiffs cannot anticipate what if any action will be taken thereunder and therefore at this time ask no relief based thereon.

At the brief hearing on Wednesday, H. Chaffetz, of the Department of Justice, appeared on behalf of the board and argued that the railroad bill was premature, on the ground that no showing had been made of any great immediate injury to the roads. He said the board had proposed to issue two orders, calling for an advance payment of one-tenth of one per cent of the amount of the July payrolls, so that the board could get under way, and for a list of the employees who would reach the age of 70 before February 1, 1935, but that under the law the first regular contribution would not be due until November. In the absence of a showing of injury, he said, the court must assume that the statute is probably valid. The judge declined to consider the merit at the preliminary hearing. Mr. Prince, representing the railroads, indicated that they would have no serious objection to a call for a limited amount of money but said they should be protected against any orders calling for more than a definite amount and Mr. Chaffetz said the board could not be bound not to issue further orders or not to call for data regarding employees reaching the age of 65. Mr. Prince said that in conference with counsel for the board counsel for the railroads had attempted to reach an amicable arrangement but that it had been fruitless because of disagreement as to the amount. Judge Proctor said that the real question was as to whether any order issued by the board was likely to work great damage to the railroads and that if the law were eventually held to be unconstitutional he could not conceive that Congress would not provide for a reimbursement. He said he was impressed that the attitude of the board for the present would be to go no further than necessary and that no proper showing had been made to justify a temporary restraining order.

The board has appointed Harry Schulman, associate professor of law at Laye Law School, as special counsel.

Rail Output Shows Small Increase in 1933

RAIL production in the United States in 1933 totalled 416,296 gross tons, which represented an increase of 13,730 tons as compared with 1932, according to figures compiled by the American Iron and Steel Institute. The output for 1933, however, with the single exception of 1932, was the lowest for any year since 1866 and compares with a production of 3,217,649 tons in the peak year of 1926 and of 1,157,751 tons in 1931. The production last year was characterized by a reduction of 61,084 tons in the output of rails weighing 100 and less than 120 lb. per yd., which was more than offset by increases in the output of all other classes by weight, including an increase of 28,265 tons in the production of rails weighing 120 lb. per yd. and over.

Rails rerolled from old rails in 1933 amounted to 18,204 tons as against 9,488 tons in the previous year, while the production of alloy-treated steel rails showed only slight change, being 437 tons last year as compared with 565 tons in 1932. Bessemer steel rails remained a negligible factor, the production last year amounting only to 300 tons as against 64 tons in the previous year.

Production of Rails by Processes, 1918-1933, Gross Tons

Years	Open-hearth	Bessemer	Electric	Rerolled*	Total
1918.....	1,945,443	494,193	.....	101,256	2,540,892
1919.....	1,893,250	214,121	50	96,422	2,203,843
1920.....	2,334,222	142,899	297	126,698	2,604,116
1921.....	2,027,215	55,559	5	96,039	2,178,818
1922.....	2,033,000	22,317	.....	116,459	2,171,276
1923.....	2,738,779	25,877	118	139,742	2,904,516
1924.....	2,307,533	16,069	.....	109,730	2,433,332
1925.....	2,691,823	9,687	.....	83,747	2,785,257
1926.....	3,107,992	12,533	.....	97,124	3,217,649
1927.....	2,717,865	1,566	.....	87,055	2,806,486
1928.....	2,580,141	2,718	438	64,196	2,647,493
1929.....	2,662,163	3,486	723	55,766	2,722,138
1930.....	1,834,933	2,137	45	36,118	1,873,233
1931.....	1,135,551	813	15	21,372	1,137,751
1932.....	393,014	64	.....	9,488	402,566
1933.....	397,792	300	.....	18,204	416,296

* Rerolled from old steel rails.

Production of Rails by Weight Per Yard, 1918-1933, Gross Tons

Years	Under 50 pounds	50 and less than 85			85 and less than 100			100 and less than 120			Total
		than 85	and less than 100	and less than 120	120 and over						
1918.....	395,124	665,165	888,141	.....	592,462	2,540,892					
1919.....	263,803	495,577	965,571	.....	478,892	2,203,843					
1920.....	489,043	433,333	952,622	.....	729,118	2,604,116					
1921.....	211,568	214,936	902,748	.....	849,566	2,178,818					
1922.....	265,541	274,731	728,604	.....	902,900	2,171,776					
1923.....	272,794	300,907	864,965	.....	1,465,850	2,904,516					
1924.....	191,046	213,274	853,431	.....	1,175,581	2,433,332					
1925.....	163,607	219,648	765,371	.....	1,636,631	2,785,257					
1926.....	197,260	256,287	797,662	.....	1,966,440	3,217,649					
1927.....	161,836	173,257	539,445	1,314,424	617,524	2,806,486					
1928.....	134,197	125,726	465,393	1,203,749	718,428	2,647,493					
1929.....	141,362	102,944	409,628	1,233,599	834,605	2,722,138					
1930.....	95,626	81,299	267,879	835,496	592,933	1,873,233					
1931.....	50,089	25,524	123,398	495,752	462,988	1,157,751					
1932.....	16,655	13,705	28,593	215,091	128,522	402,566					
1933.....	*49,116	†15,413	40,973	154,007	156,787	416,296					

* Under 60 pounds per yard.

† 60 and less than 85 pounds per yard.

Production of Alloy-Treated Steel Rails, 1922-1933, Gross Tons

Years	Total production	Production by alloys		Production by processes		Under 50 lbs.	50 and under 85 lbs.	85 and under 100 lbs.	100 and under 120 lbs.	120 lbs. and over
		Titanium	Other alloys	Openhearth	Electric					
1922.....	3,163	2,493	670	3,163	.....	.....	321	835	2,007	.....
1923.....	2,142	346	1,796	2,024	118	.....	56	317	1,769	.....
1924.....	5,167	1,696	3,471	5,167	.....	.....	.....	847	4,320	.....
1925.....	4,009	1,616	2,393	4,009	.....	70	47	.....	3,892	.....
1926.....	4,216	1,099	3,117	4,216	.....	.....	42	1,027	3,147	.....
1927.....	1,265	.....	1,265	1,265	.....	.....	.....	374	391	500
1928.....	6,453	3,711	2,742	6,015	438	29	.....	879	1,652	3,893
1929.....	1,965	486	1,479	1,242	723	100	.....	748	967	150
1930.....	4,687	517	4,170	4,642	45	146	.....	885	1,137	2,519
1931.....	533	.....	533	518	15	.....	.....	282	232	19
1932.....	565	.....	565	565	.....	.....	.....	75	490	.....
1933.....	437	.....	437	437	.....	.....	.....	134	303	.....

How the Erie Has Reduced Highway Crossing Accidents

Nine important features in program which effects 23 per cent reduction

DURING the last few years the Erie has carried on a consistent program to reduce the number of accidents at highway crossings. One measure of the success that is being attained is a 23 per cent reduction in the number of such accidents in 1933 as compared with 1932, the total for 1933 being 181 accidents as compared with 237 the year previous. This reduction compares with 7.5 per cent for the entire country for the same years. In other words, the Erie effected three times as great a reduction in the number of accidents as the railroads as a whole. The record has been accomplished by following a definite program based on nine major activities.

The use of the locomotive whistle to warn highway travelers of the approach of a train is taken seriously on the Erie. Code Rule 14L, requiring two long and two short blasts of the whistle when approaching a crossing, has been revised to require the engineman to prolong the last blast until the locomotive arrives at the crossing. For slow-speed trains, where too long a blast would be objectionable, the engineman blows the usual code at the whistling post, and then blows it again as he approaches the crossing; in either case the whistle must be blowing as he arrives at the crossing. The blowing of the whistle is not left to instructions only, for every day certain supervisory officers on the Erie make 10 tests or observations to see that this rule is being lived up to. A report giving the time, place and train at which each test was made, goes to the operating vice-president once each month.

Improving the Crossings and View

According to studies made by the Erie, the character of the crossing itself is a factor in preventing accidents. The thought is that if the surface is so smooth as to require no slackening of speed of the automobile or special attention of the driver, he will have a better chance to clear the crossing, especially if he has already started over it before he observes an approaching train. This conclusion is born out by the fact that during 1933 there were 43 accidents, or 24 per cent of the total on the Erie, in which the drivers evidently became confused while crossing the tracks and stalled their vehicles on the track ahead of the on-coming trains. Working on this basis, the Erie started in 1929 to make its crossings smoother and wider. In the past six years, 241 crossings have been permanently improved at an approximate total cost of \$400,000, as shown in detail in the table.

Another important item in reducing the number of accidents, is to give the automobile driver every opportunity possible to see an approaching train. Improvement in this respect is accomplished by removing trees, brush, sign boards and fences, which obstruct the view of the tracks from the highway. In a few cases old buildings have been removed and high banks cut down. Periodically each division superintendent, together with the division engineer and claim agent, make an inspection of all crossings on their division in order to note objects which obstruct the view of approaching trains. If an obstruction is located on private property, the owner is informed of the desire to increase the safety for highway users, and he will ordinarily co-operate by permitting the railroad to remove the brush or other obstructions. When objections are encountered, the aid of municipal authorities is enlisted.

Highway traffic conditions at many of the crossings change from time to time. A highway may be paved and attract a heavy traffic, or the construction of a paved highway some distance away from the railroad may cause certain minor connecting highways to be subjected to heavier traffic. In order to keep a check on these changing conditions, an inspection of every crossing on the railroad is made annually by the superintendent of telegraph and signals, in company with the division operating and engineering officers. In addition to making a study of the traffic, consideration is given to the existing protection and to the advisability of providing additional safeguards. Each crossing inspected is classified, for the installation of automatic crossing signals, advance warning signs, or reflex button crossbucks, or for a relocation of an existing crossing sign.

For the past four years the Erie has followed an extensive and consistent program of installing automatic crossing protection and of improving that already in service, involving an expenditure of \$97,000 to \$164,000 annually, the appropriation for 1934 being \$103,886. This latter program includes the installation of flashing-light signals at 30 crossings and wigwags at 5 crossings. In order to protect the crossings for trains running against the normal direction of traffic, it has been necessary to provide additional track circuits, 42 such reverse-operating circuits being installed in 1933 and 32 in 1934.

Flashing-light signals are being installed on the Erie in accordance with American Railway Association standards. Signals are mounted on 4-in. pipe posts set on concrete foundations. The flashing lights show in

both directions on the highway, while a reflector-button sign reading "Stop on Red Signal" is located on the mast below the signals, and immediately above the signals is a reflector-button sign indicating the number of tracks in the crossing. A crossbuck sign, which splits the pole, is located at the top of the pipe post, the sign reading "Railroad Crossing" in reflector buttons on the front and painted letters on the back.

Consideration is also given to improving the automatic signals now in service. For example, during 1933 the



Crossings Have Been Made Wider and Smoother

aspects of 240 wigwag signals were improved by replacing the 3-in. lenses with 5-in. spread-lite lenses, which not only give a better night indication but also afford a light indication by day which adds to the effectiveness of

Expenditures for Improvements to Crossings

Year	Concrete or Metal	Amiesite	Sheet Asphalt	Tarvia	Widening Crossings
1929	\$107,647	\$4,360	\$9,600		
1930	103,114				
1931	57,607				
1932	49,278	17,653		\$804	\$13,646
1933	11,127	12,010			
1934	32,845	11,933			2,393
Total	\$361,618	\$45,956	\$9,600	\$804	\$16,039

the signal. As a means of improving the protection afforded by flashing-light crossing signals, the Erie is following the recommendations of the American Railway Association's Joint Committee on Highway Crossing Protection, by applying "Stop on Red Signal" button-type reflector signs on existing signal masts below the flasher lights. Such signs were installed on the signals at 67 crossings in 1933 and at 187 crossings in 1934.

The annual field inspection of each crossing also includes existing signs, and recommendations are made as to improvements in this type of protection. In some instances, the existing crossbuck sign can be moved to a location that can be seen more readily, while in other cases a second crossbuck sign is recommended, although state regulations may require only one such sign at a crossing. In order to improve this type of protection at some crossings, button-type reflector crossbuck signs are installed, a total of 54 of these signs having been placed in service in 1933 and 68 so far in 1934.

The next feature considered is the approach warning signs, which, in the opinion of several officers of the Erie, are a very important part of the crossing protection. Many observations show that the majority of automobile drivers will exert some degree of caution,

provided they receive advance warning of their approach to a railroad track. Many of the states through which the Erie operates have provided these approach warning signs on a basis whereby the railroad pays for the signs and the state installs and maintains them. However, in many instances the signs were not located properly and have not been maintained. Weeds and

Additional Crossing Protection Installed Each Year

	1931	1932	1933	1934	Total
Number of crossings:					
Signs			67	187	254
Devices	49	31	25	30	135
Money expended	\$137,908	\$164,435	\$97,000	\$103,886	\$503,229
Flasher signals	94	70	42	52	258
Wigwag signals	1	3	12	5	21
Reverse operating circuits	13	14	42	32	101
Illuminated stop signs	8	50			58
Annunciators, cut-outs, etc.	1	2	1	4	8
Signs:					
Reflector button approach			121	374	495
Reflector button crossbuck		54	68		122

brush are allowed to grow up and obstruct the view of the signs. Regardless of the fact that the state or county highway organization is responsible for these conditions, the railroad is blamed for accidents resulting from inadequate approach warning signs. For example, in the investigation of one accident, the plaintiff proved that the approach warning sign was not located the specified distance from the tracks, that it was obscured by brush, and that it had been damaged and rusted to the extent that one of the "RR" letters was obliterated. Based on such cases, the Erie has decided that, regardless of the responsibility, it is good business for the railroad to see to it that proper approach warning signs are in service and maintained. As a result, weeds and brush are kept cleared away from the signs. A continual check is made to see that the signs are properly located and, if there are no signs at points where they are considered necessary or desirable, the railroad takes the necessary steps to see that they are installed. The reflector-button type of approach warning signs is used. Efforts along these lines have resulted in 121 of these reflector-button approach warning signs



The Flashing-Light Signals Show in Both Directions and Are Equipped with Proper Signs

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NEW CONDITIONS



Require NEW FACILITIES

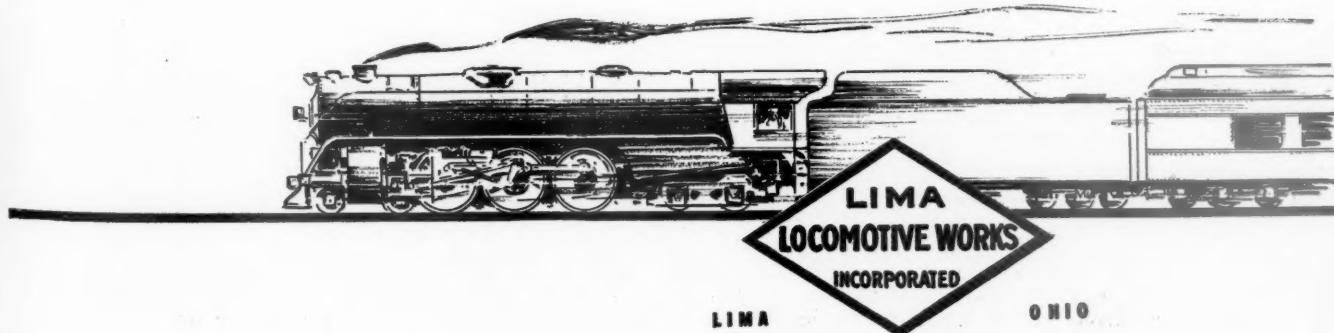
The traveling public and the shipper are both transportation conscious today as never before.

Speed, comfort, convenience, safety are factors that must be provided to attract business.

Efficiency, economy and flexibility are equally essential to show an operating profit.

Only in the steam locomotive can all these factors be provided.

The streamlined Super-Power steam locomotive is capable of providing the highest speed you can use, the greatest hauling capacity and the lowest operating cost with the greatest safety.



being installed in 1933, while 354 such signs are being installed in 1934, in addition to 20 signs of the non-reflector button type in locations where there is no night train service.

On the 2,444 miles of road on the Erie, there are 2,200 highway and street grade crossings. Special protection, other than fixed signs, is in service at 813 of these crossings. Flashing-light signals are in service at 420 crossings, wigwags at 127 crossings and bells only at 97 crossings. Gates, together with flashing-light signals, are used at 8 crossings, while gates and bells are in service at 47 crossings; gates alone, protect 114 crossings. Of the 169 crossings at which gates are in service, 105 are attended 24 hours daily, while the remainder are attended part time.

A record is maintained in the office of the superintendent of telegraph and signals of the type of protection such as signs, signals, bells, etc., in service at each crossing, and a notation is shown as to the view and the approximate volume of highway traffic, i.e., heavy, medium or light traffic.

In order to inform the public as to the necessity for exercising caution at grade crossings, the Erie carries on an extensive educational program. Representatives of the safety department have a regular schedule of brief talks to school children, in which emphasis is laid on the necessity of watching for trains and observing the signals before crossing the track. The school superintendents and teachers co-operate further by making reference to these matters from time to time.

Representatives of the operating department, as well as of the safety department, make talks before luncheons of such organizations as Kiwanis and Rotary clubs. Included in these talks is a brief mention of the liability of accidents at railroad crossings and an explanation of the necessity to watch for a second train on multiple-track lines just as one train clears a crossing.

Publicity an Important Factor

The public relations organization of the Erie also plays an important part in increasing the effectiveness of crossing protection. When a new crossing signal is to be placed in service, a news item is prepared and sent to all of the newspapers in towns within 25 miles of the installation. This announcement includes a description of the new signal and explains the aspects displayed, so as to refresh the memories of readers that when such a signal is operating a train is approaching. If on a multiple-track line, a statement is included explaining also that if the signal continues to operate after a train passes, it indicates that a second train is approaching. In practically all cases, these articles are published by the newspapers and, in addition, editorials are frequently written to tie in with the articles. To assist in preparing such editorials, the Erie sends information to the editors concerning crossing accidents all over the country, as well as in the particular state concerned.

Co-operation of the editors of newspapers has also been secured in preparing reports of accidents so that a statement will be included to the effect that the locomotive whistle was blown and that the flashing-light signal was operating to warn the automobile driver of the approach of the train. Signal department employees, claim agents and operating officers, who arrive at the scene of accidents soon after they happen, are instructed to get all the information possible and advise headquarters at once, so that the proper story can be sent to newspapers. In this way the facts are given to the public and at the same time an opportunity is given to drive home a lesson concerning the observation of protection provided by the railroad.

Odds and Ends . . .

Honest Railroad

Let no one say that the Norfolk & Western is not an honest railroad. Although defeated by both the C. & O. and the S. P. in the recent tall man contest, its officers firmly resisted the temptation to hire a seven-footer from the wilds of West Virginia who presented himself to them, and who would easily have regained the crown.

Bring 'Em Back Alive

For three days, passengers using the Dearborn station in Chicago were treated to the spectacle of a monkey racing about among the rafters of the train shed, and eluding the most persistent efforts at capture. Eventually though, someone evidently experienced in the power of feminine wiles brought over a female monkey and caged her near a trap. It wasn't very long until the fugitive, listening, as so many of us have, to the call of the false siren, went in search of her and was duly caught in the trap.

Educated Red Caps

Passengers turning over their luggage to the colored ushers at the Illinois Central station at Chicago probably do not realize the high degree of education prevalent among these red-caps. Not only do the ranks of these men contain many students at present, but the list of colored professional men now practising, who obtained funds for their education in this red cap corps, is surprising. It includes six lawyers, eight physicians, five dentists and two teachers. The corps is also the proud possessor of a club and a splendid building to house it, the club devoting itself to literary and other cultural activities as well as social affairs.

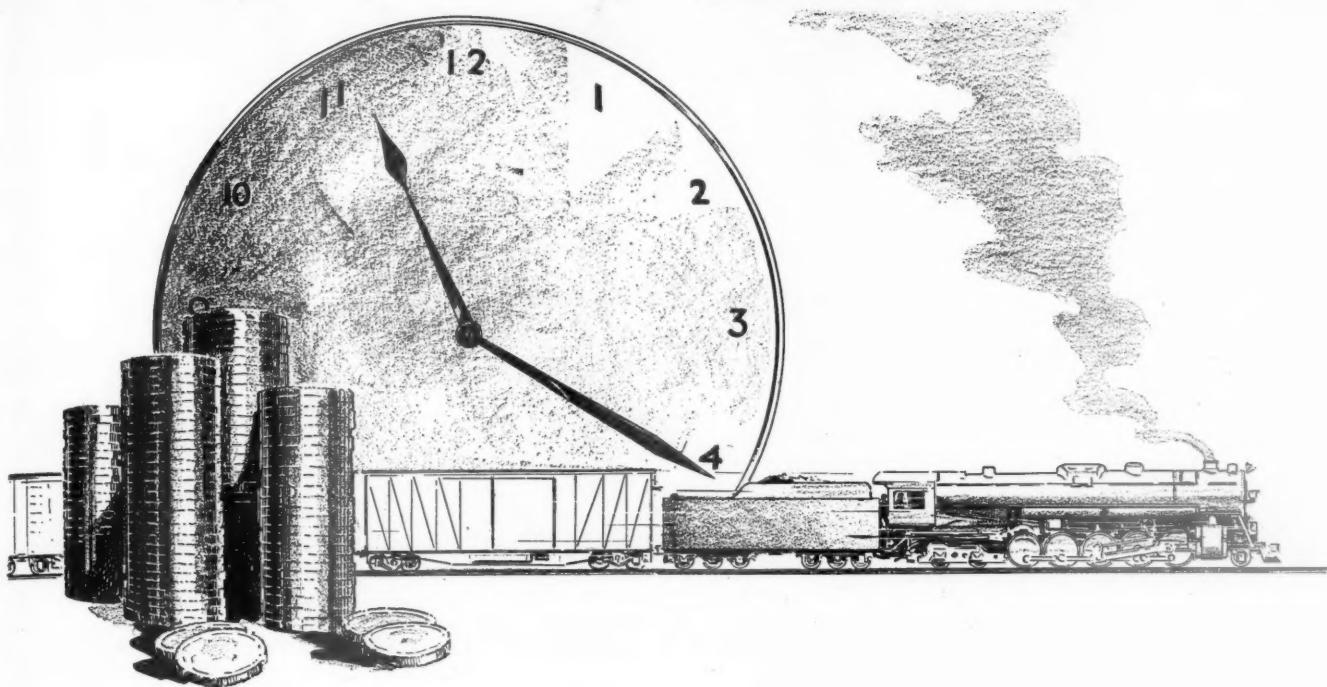
Record Shipment

Agent W. B. Wyatt, Norfolk & Western, Pulaski, Va., got the thrill of a lifetime recently. From his station he dispatched the biggest shipment ever handled at Pulaski in a single day—a mammoth assortment of dry goods, consisting of 360,000 pieces, placed in 214 separate cases and consigned to 152 destinations scattered throughout the United States. The big load, which weighed 21,139 lb. required 152 separate waybills and bills of lading to cover the shipment. All the cases moved by rail—167 by freight, 28 by express and 19 by parcel post. The material was handled quickly and efficiently. The shipper loaded the goods in a car on his siding in the morning, the load was then unloaded at the station and repacked in other cars. A few hours later—in the afternoon—the dry goods was on its way to the 152 destinations.

The Story of Peter Perry

Flames which destroyed an old cabin on the hillside near Evaro, Mont., a few miles west of Missoula recently, removed the last reminder of an individual who for many years spectacularly contested the right of a railroad to a 400-ft. strip of its right of way. The man was Peter Perry, and the railroad was the Northern Pacific.

Perry contended that he was the rightful owner of the strip of land. He adopted various means to prevent the operation of trains and was a source of irritation to railroad employees for a number of years. He periodically rolled logs on to the railroad tracks from the hillside above and at one time attempted to place a gate across the tracks, which he intended to use as a toll gate for the trains. At another time he erected a fence along the rails, driving posts into the right of way. In 1921, the Northern Pacific brought suit in the district court at Missoula to recover damages. The railroad obtained a temporary injunction, and in January, 1922, a decree was entered holding that the railroad was the rightful owner of the property and a permanent injunction was issued to prevent Perry from entering upon the company's property. Subsequently, to salve Perry's wounded feelings, the railway effected a settlement with him and the war finally ended. Perry died a few years ago when he was more than 80 years of age.



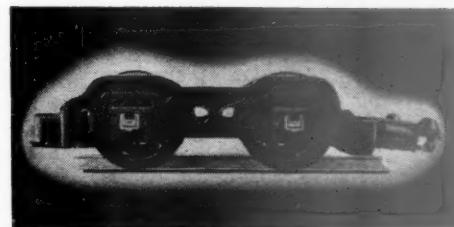
MAKE EVERY MAINTENANCE DOLLAR PRODUCE ITS SHARE OF TON MILES

The greater proportion of the time a locomotive is hauling a full capacity train the lower the maintenance costs per 1,000 ton miles.

In the design of new power maintenance can be kept at a minimum by proportioning the cylinders and driving wheel arrangement to meet the average requirements over the run. For starting and for the heavy grades utilize the added tractive effort of the Booster.

This reduces the excess weight that must be hauled and reduces the stresses on every part of the locomotive.

It is the surest way of making every dollar spent for maintenance produce its full share of ton miles.



When maintenance is required a replacement part assumes importance equal to that of the device itself and should be purchased with equal care. Use only genuine Franklin repair parts in Franklin equipment.



FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK

CHICAGO

MONTREAL

NEWS

Faster Trains Planned Chicago to Twin Cities

Zephyr's 6 hr. 4 min. on trial run soon to be approximated by regular schedules

The Chicago, Burlington & Quincy, the Chicago & North Western and the Chicago, Milwaukee, St. Paul & Pacific are planning substantial reductions in the schedules of passenger trains operated between Chicago and the Twin Cities. While the plans are still indefinite, the reductions will range from two to four hours and thus place some trains on 6½ hr. and 9 hr. schedules, as compared with the present schedules which range from 10 hr. 30 min., to 13 hr. 15 min. for route distances ranging from 407 to 431 miles.

The necessity for increased speed between these points has been reflected in the competition with buses and private automobiles which have been able to cover the distance in less than a day, following the improvement of cars and highways. At the present time it is not uncommon for drivers of private automobiles to average 50 m.p.h. between the two cities. Faster passenger schedules have also been necessitated by the establishing of 11-hour freight schedules in order to maintain the tradition that passenger schedules must be substantially faster than freight schedules.

Part of the program for faster trains between Chicago and the Twin Cities involves the operation of two high-speed streamlined, three-car, articulated trains by the C. B. & Q. These trains, similar to the Zephyr, are to be placed in regular daylight service, leaving in the afternoon on a 6½ hr. schedule. Unlike the Zephyr, the new trains will not carry mail, the additional space gained through the elimination of the mail compartment being given over to the accommodation of additional passengers.

To confirm the feasibility of a 6½ hr. schedule for these trains, the Burlington on July 30, operated its Zephyr from Chicago to St. Paul, 431 miles in 6 hr. 4 min., including 6 stops of 1 min. standing time each. Returning, the distance was covered in 6 hr. 10 min., more time being taken for stops. The schedule in detail was as follows:

Left Chicago		9:30 A.M.
Arrived Aurora	38 mi.	10:03 A.M.
" Savanna	145 mi.	11:32 A.M.
" E. Dubuque	185 mi.	12:08 P.M.
" Prairie du Chien	239 mi.	12:52 P.M.
" LaCrosse	298 mi.	1:39 P.M.
" E. Winona	326 mi.	2:00 P.M.
St. Paul	431 mi.	3:34 P.M.
Average 71 m.p.h.		

Georgia Roads Fight Rate Slash

The railroads operating in Georgia planned to file with the federal court in Atlanta on August 15 a petition asking for an order to prevent the State Public Service Commission from making effective an 18 per cent class freight rate reduction on August 20.

N. & W. Passenger Traffic Up 80 Per Cent

A gain of more than 80 per cent was shown in the number of passengers handled by the Norfolk & Western during the first five months of this year over the same period of 1933. The increase is ascribed to improved and air-conditioned equipment, new low fares, and an effective campaign by the railway's employees to encourage their friends and neighbors to travel on N. & W. trains.

Air Express Rates Reduced

Rate reductions on air express have been announced by the Railway Express Agency, effective August 15. Shipments of packages weighing ¾ lb., or less, will be carried at a flat rate of 85 cents, regardless of distance. The corresponding charge for a one pound shipment is \$1. Minimum charges previously ranged up to \$1.80. General lowering of tariffs effects particularly the lighter-weight shipments, which now constitute the greater percentage of packages handled over the airlines. Yet the new rates also provide for air shipment of packages weighing up to 25 lb. between cities 149 air miles apart, at a cost of \$1 including special pick-up and delivery. The Agency's Air Express Division operates over a nation-wide system of airlines including more than 115 cities.

Railroads to Make Intensive Study of Competitors

Dr. C. S. Duncan, economist for the Association of Railway Executives, is to direct the intensive study of competitive transportation agencies undertaken by the association in accordance with action taken at its recent Atlantic City meeting, "with a view to ascertaining facts which would enable the railroads better to appraise the force of this competition and to take steps to meet it." A regional organization has been formed to assist in the work, with three regional directors: R. J. Littlefield, superintendent of motor service, Pennsylvania; Robert S. Henry, assistant to the vice-president in charge of traffic, Nashville, Chattanooga & St. Louis; and Joseph H. Hayes, counsel for the Western Association of Railway Executives.

Railway Extension Foreseen for Canada

E. W. Beatty suggests that amalgamation savings would provide construction funds

There is still a future for railway development in Canada, in the opinion of E. W. Beatty, chairman and president of the Canadian Pacific, and he suggests that the funds needed for these extensions could be found without bond issues from the savings possible under unification of the Canadian National and the Canadian Pacific.

"We have got to build more railroads," said Mr. Beatty in Montreal last week. "Mineral development in the far north, extensions of discoveries of arable land in the north, the painful experience in certain southern districts—all this mean that we from a transportation standpoint will provide, either by a private company, or by the government, such facilities as the logical and legitimate development of these sections of the country demands. I do not see how we can avoid it."

"I believe that enough money could be saved out of unification to enable this cost to be incurred with little or no borrowing."

As to the success of the voluntary co-operative efforts now being made by the railways to reduce competitive costs, he pointed out that at end of this year valuable data will be available.

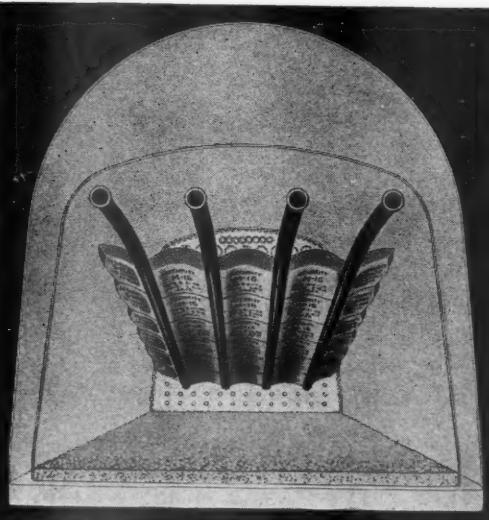
"It will be another year's experience under somewhat better conditions than we experienced in 1933," he said, "but neither the moderate improvement the year may give us nor the extent of co-operative economies is likely to change the fundamental issue as to whether the country can or should attempt to afford the luxury of railway duplication where it exists."

"If the Canadian Pacific were paying its dividends and the National Railways were earning all the interest due the public, we would still have enormous economic waste attributable to maintaining unnecessarily more railway facilities than the business of the country requires."

"As to the labor aspect, I am satisfied that we can meet it. The natural turnover of labor is about five per cent. Plus more general and generous utilization of our pension funds, plus furloughs to those who desire to retire, for many reasons, prior to reaching the pension age, and plus the extension of this retirement over a considerable period of years—while it may postpone for a short time the complete advantages of unification, it will allow it to be accomplished without hardship to employees, who certainly do not deserve to be penalized."

Continued on next left-hand page

HELP THE ARCH GET STARTED RIGHT



*There's More to SECURITY
ARCHES Than Just Brick*

American Arch Company service starts when the new locomotives are on the drawing board. Assisted by engineers of the American Arch Company the Arch gets off to a proper start by being properly designed. Then when the new power arrives, an American Arch Company service man is on hand to welcome it.

He checks the Arch; the style of brick; the spacing of Arch tubes and the positioning of Syphons.

Storekeepers are visited to be sure that the desired Arch brick are available when repairs are needed.

From the Arch standpoint everything possible is done to smooth the way for the new power.

This is just one of the functions of American Arch Company service men but many mechanical officers gladly testify as to its value in getting new power off to a good start.

**HARBISON-WALKER
REFRACTORIES CO.**

Refractory Specialists



**AMERICAN ARCH CO.
INCORPORATED**

**Locomotive Combustion
Specialists** » » »

and I think that all can be accomplished wisely and carefully and fairly, if slowly. I am not worrying about that at all.

"We are working every week on plans for pooling train services," he said. "Various committees are exhausting every angle, from Saint John to Vancouver, and while we are proceeding slowly, we are making as much progress as could be expected, and I am quite satisfied it is being tackled with the utmost goodwill and good faith, and that is all we can expect. There is a type of pooling that makes economies, but costs one or other of the participants, in goodwill and contacts and 'beyond' business or freight business, more than can be saved by pooling, and that is poor business. There is a type of pooling between two terminals, especially where we have common terminals at each end, where joint operation is not a bit harmful to individual companies and makes for genuine economies. Each case stands upon its own feet and in view of the fact that there has never been pooling in Canada before, and a very limited amount in the United States, each pooling attempt is an experiment."

Toledo Transportation Club Elects Officers

At a recent meeting of the Toledo Transportation Club the following officers were elected: President, F. M. Shelton, superintendent of the Wheeling & Lake Erie; first vice-president, U. E. McFarland, general traffic manager of the Owens-Illinois Glass Company; and second vice-president, D. W. Sanzenbacher, division freight agent of the New York, Chicago & St. Louis.

Lower Rates to Atlantic City

The Pennsylvania and the Central of New Jersey-Reading are offering new low rates between New York and Atlantic City. Until September 2 they will sell on any day of the week a two-day round-trip ticket for \$3.25. This ticket will be good for three days over the Labor Day weekend. The same rate will be available Saturdays only from September 8 to 29.

The time limit on four-day New York-Atlantic City excursion tickets, costing \$6, has been extended to 10 days until September 30.

June Locomotive Shipments

June shipments of railroad locomotives from the country's principal manufacturing plants, as reported to the Bureau of Census, United States Department of Commerce, totaled 3 as compared with 34 in May and 2 in June, 1933. Unfilled orders at the end of June totaled 138 locomotives (78 steam and 60 electric) as compared with unfilled orders for 71 locomotives, including 5 steam and 66 electrics at the end of June, 1933. These figures do not include data on locomotives built by railroads in their own shops.

B. C. Seeks to Rid Itself of P. G. E.

Premier T. D. Pattullo of British Columbia appealed to the Dominion government at Ottawa last week to merge the Pacific Great Eastern, which is owned by the province of British Columbia, into the Canadian National. Prime Minister R. B.

Bennett who heard the appeal in the presence of the rest of the cabinet, gave no immediate answer, indicating he would study the representations and come to a decision later.

The Pacific Great Eastern was built between 1912 and 1921 and was intended as a branch line of the Grand Trunk Pacific.

Heavier Loading of L. C. L. Cars Reported by P. R. R.

Heavy increases in the average loading of freight cars, carrying l.c.l. traffic on the Pennsylvania were reported recently by J. R. Downes, chief of freight transportation. The greatly improved loadings, it was stated, are the result of a system-

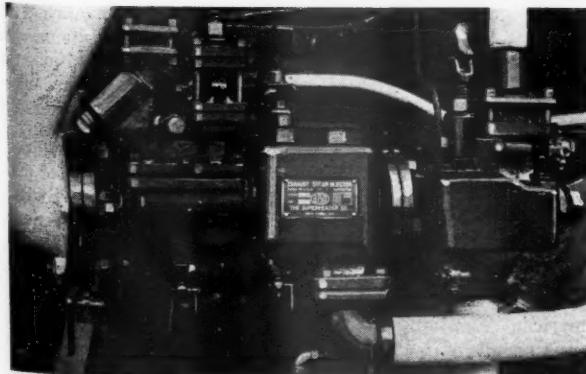
wide campaign to get more work out of each individual car. The purpose has been to increase the efficiency of the merchandise freight service by handling a substantially larger tonnage without material increase in the number of cars required, thus saving both in the car movements and in the wear and tear on equipment. At the same time service has been stepped up by operating more through cars and lessening the rehandling of their contents.

Last December, 220,761 tons of l.c.l. freight were hauled between points on the Pennsylvania system. To render this service, 67,296 box cars were used and the average load per car was 6,600 pounds. In June of the present year, 323,527 were

The Great Western of Great Britain, by Injecting a Human Interest Appeal, Enlivens the Advertising of its Household Goods Removal Services. This Display Appeared in the Advertising Pages of a Recent Issue of the Railway Gazette (London)

Continued on next left-hand page

Good News for Your TEN-YEAR-OLDS



CONSTANTLY greater steaming capacity is essential to meet the needs of modern railroading — to get big trains over the road at high speed.

Elesco exhaust steam injectors increase the steaming capacity of any locomotive. That's what they are for.

This means new life to those underboilered locomotives built about ten years ago.

It means an opportunity to enable them to compete with efficient modern power.

Investigate!



Superheaters
Feed Water Heaters
Exhaust Steam Injectors
Superheated Steam Pyrometers
American Throttles

THE SUPERHEATER COMPANY
Representative of AMERICAN THROTTLE COMPANY, INC.

60 East 42nd Street
New York



Peoples Gas Building
Chicago

Canada: The Superheater Company, Limited, Montreal

carried in 64,072 cars and the average load had mounted to 10,100 pounds, a gain of 53 per cent. An increase of 46 per cent in total business was transported in 5 per cent fewer cars.

"An important factor in the success of the campaign," Mr. Downes said, "has been the steady growth in the patronage of our store door collection and delivery service since its inauguration not quite eight months ago. This has not only brought more business, but has greatly aided in its concentration. Careful studies have also been made of the most direct and expeditious methods in all details of handling merchandise freight, and the information gained has been utilized wherever practicable. The best average loads are being obtained on the through traffic, where the competition of unregulated trucks is least felt. The high record for the system, 13,500 pounds per car, was reached on the westbound business from points in the eastern region to western region points, where practically all the hauls are beyond the range of truck competition."

Railway Employment For July

Class I railways reported to the Interstate Commerce Commission a total of 1,047,977 employees as of the middle of the month of July, an increase of 5.99 per cent as compared with the number in July, 1933, but a decrease of .58 per cent as compared with the number in June. The number of maintenance of way employees was 12.18 per cent greater than that for July last year while the train and engine service employees showed an increase of 3.41 per cent. Adjusted for seasonal variation the number of employees in July was 57.1 per cent of the average for 1923-1925.

Dunn to Address N. & W. Employees

An all day business session, which will have as its general theme "better railroad service in all of its phases," an address by Samuel O. Dunn, editor of the *Railway Age* and chairman of the Simmons-Boardman Publishing Company, and the expected appearance of a nationally known entertainer, are features of the fifteenth annual system conference of "better service clubs" of Norfolk & Western employees, which will be held at the Netherland Plaza Hotel, Cincinnati, Ohio, September 14, according to preliminary plans for the meeting.

Approximately 300 delegates will attend the conference. A telephone hook-up, embracing the entire railway system, will carry the proceedings of the evening session to thousands of the railroad's workers, whose local Better Service Clubs in 21 other cities and towns will meet simultaneously as a part of the system conference.

R. F. C. to Market P. W. A. Equipment Obligations

Federal government agencies that have been loaning money to the railroads are taking steps to get some of the money back at once. The Reconstruction Finance Corporation has offered for sale by asking for competitive bids a list of railroad and municipal securities taken by the Public Works Administration in connection with the loans it has made amounting to \$5,889,370, including \$1,200,000 of Chesapeake &

Ohio equipment trust certificates and \$1,205,000 Lehigh & New England equipment trust certificates, both bearing 4 per cent interest. This is the initial offering under a plan announced recently by which the R. F. C. hopes to market a considerable amount of securities held by the P. W. A., the proceeds to be turned back to the latter and made available for additional loans, as the P. W. A. has already exhausted most of the funds appropriated for it. Railroad equipment trust certificates were taken by the P. W. A. for the loans made to railroads for the purchase of new equipment, while its loans for other purposes have been generally secured by bonds and other securities as collateral and it is understood that the equipments are considered as being among the most marketable class of its securities.

"Railplane" Exhibited at Washington

A demonstration of a new system of transportation, known as the "Railplane," was given before representatives of the press at Washington, D. C., on August 3. The system was developed in Scotland and the model recently brought to the United States by Alexandre Djakeli of Brussels, who controls the rights and who has granted to J. Carson Adkerson the authority to present it to the United States.

The system consists of a single overhead carrier rail from which a streamline car is slung on the traveling bogies. A second rail runs beneath the center of the car for the purpose of limiting the sway of the car and for controlling it on curves. The car is driven by means of air propellers and the system is provided with equipment for automatic signaling, lighting, power distribution and safety devices. The system is proposed to be used independently or in connection with existing railways for high-speed passenger service. The "Railplane," it was claimed, will make speeds of from 200 to 300 miles per hour with safety and comfort at an operating cost of less than 10 per cent of the present cost of railway transportation. A short full-sized operating line of "Railplane" has been installed at Milngavie, Scotland, for experimental purposes and is declared to be a success.

Equipment and Supplies

FREIGHT CARS

THE HOOKER ELECTROCHEMICAL COMPANY has ordered four tank cars from the American Car & Foundry Company and four from the General American Tank Car Corporation. These cars are all of 30 tons' capacity and will be used for carrying liquid chlorine.

IRON AND STEEL

NEW YORK CENTRAL.—A conditional contract has been given to the American Bridge Company for about 1,000 tons of steel to be used in constructing an over-

head viaduct at Weehawken, N. J. The George A. Fuller Company is the contractor.

THE LOUISVILLE & NASHVILLE is inquiring for 350 tons of structural steel for miscellaneous bridge work in Kentucky.

THE MERIDIAN & BIGBEE RIVER has ordered 1,200 tons of structural steel for a bridge over the Tombigbee river from the Virginia Bridge & Iron Co.

Supply Trade

THE ZALK-JOSEPHS COMPANY, Duluth, Minn., has been appointed a distributor for the Macwhyte Company, Kenosha, Wis.

ARTHUR ROEDER, formerly president of the Colorado Fuel & Iron Co., and since August 1, 1933, receiver, has been appointed temporary trustee under the new federal bankruptcy law.

THE VILOCO RAILWAY MACHINE CO., and the Viloco Railway Equipment Company, Chicago, have taken over the manufacture and sale of the Whelan bypass valve, following the death of Eugene B. Whelan.

H. C. YOUNGS, tie and timber agent of the Chicago, Milwaukee, St. Paul & Pacific, with headquarters at Chicago, has resigned to become president of the Indiana Wood Preserving Company, Terre Haute, Ind., to succeed Joseph B. Card, who died June 10.

THE COLORADO FUEL & IRON COMPANY, in receivership since August 1, 1933, has petitioned Judge J. Foster Symes in the U. S. District Court at Denver, Colo., requesting that a trustee be appointed and the receivership terminated under the provisions of the National Bankruptcy Act.

RALPH C HARDEN has been appointed manager of packing sales in the Mechanical Goods division of the United States Rubber Company. He will be located at the company's main offices 1790 Broadway, New York City. Mr. Harden during the last 15 years has held several positions with the Johns-Manville Sales Corporation, the latest of which was western regional vice-president of sales with headquarters at Chicago.

W. H. ELLIOTT, who was appointed publicity representative of the Union Switch & Signal Company and the General Railway Signal Company in October, 1933, to succeed the late Henry M. Sperry, has resigned because of ill health. The work of this publicity bureau will be continued under the direction of B. T. Anderson, with V. J. Cronin acting as secretary, at the same address, 347 Madison avenue, New York.

M. J. CZARNIECKI who has been elected vice-president in charge of sales of the A. M. BYERS COMPANY, Pittsburgh, Pa., entered the service of that company in 1913 when he joined its sales organization. The following year he was assigned to the

Continued on next left-hand page

RAILROAD DIESELS FOR RAILROAD MEN



Where sufficient hours of service per day can be obtained, the savings in direct operating expenses alone will warrant the purchase of Diesel switching locomotives.

However, these direct operating savings become minor incidentals when one can eliminate such expensive facilities as coal docks, ashpits, and water towers, which in many cases are being maintained at outlying terminals and in very congested territories simply for the adequate servicing of steam switching locomotives.

This advertisement (No. 9 of a series) presents another of the many factors which, all combined, make the ALCO Diesel an outstanding purchase.

AMERICAN LOCOMOTIVE COMPANY
ALCO DIESEL
30 CHURCH STREET NEW YORK N.Y.

New York serving in that capacity until his transfer in 1915 to Chicago. After the war, in 1918, he returned to Chicago as district manager and the following year was transferred as district manager to New York serving in that capacity until



M. J. Czarniecki

1925 when he was appointed assistant general manager of sales with headquarters at Pittsburgh, Pa. In September, 1930, Mr Czarniecki was appointed to the newly created position of manager of tubular sales and subsequently he was appointed general manager of sales of the same company, which position he held at the time of his recent appointment as above noted.

Railway Brass, Car and Locomotive Journal Bearings and Castings Industry Code Authority

The following members of the Code Authority of the railway brass car and locomotive journal bearings and castings industry have been approved by the National Recovery Administration: W. H. Croft, president and F. A. Croft, vice-president, Magnus Co., Inc., Chicago; J. B. Strauch, president, and C. W. Beugger, controller, National Bearing Metals Corporation, St. Louis, Mo., and Benjamin I. Kaufmann, president, Edna Brass Manufacturing Company, Cincinnati, Ohio.

OBITUARY

George E. Molleson, for many years in the railway supply business at New York, died suddenly on August 14, at his home in the Hotel Earle, New York, at the age of 75.

Eugene B. Whelan, Omaha, Neb., died in that city on July 22 after a short illness. Prior to 1920 he was employed in the mechanical departments of the Union Pacific, the Minneapolis & St. Louis and the Terminal Railroad of St. Louis, while during the last 14 years he devoted his entire time to the sale of the Whelan bi-pass valve.

DURING the last six years the Illinois Central has carried 185,000,000 persons for a total of 3,750,000,000 passenger-miles on 2,000,000 passenger trains without a passenger fatality due to a train accident. In 1933 this railroad operated 297,000 passenger trains which safely carried 29,600,000 individuals 547,000,000 passenger-miles.

Construction

NEW YORK CENTRAL.—A conditional contract has been awarded to the George A. Fuller Company, New York, for building an overhead viaduct to carry highway traffic at Weehawken, N. J. The work calls for the use of about 1,000 tons of steel.

UNION PACIFIC.—Bids on the relocation of the line of the Oregon-Washington Railroad & Navigation Company which will be affected by the construction of the Bonneville dam, 42 miles east of Portland, Ore., will be advertised shortly by the government. The project has been divided into two parts and the first portion, on which bids will be taken, involves the line between Mile Post 35.58 and Cascade Locks,

FREE WHEELING



A 44½-ft. Truck with 8 Tons' Capacity Carrying a 33,000-lb. Load from the South to the North.

There are hundreds of these car-load freight units operating daily over your highways. They do not own the roadbed over which they travel. You do.

Between commercial motor traffic, both passenger and freight, and the railroads, the masses derive a greater benefit from railroads than motor lines. The motor lines can be made a beneficial adjunct to rail transportation, under proper regulations. Competition is the life of trade when properly bridled; but when unbridled, it is destructive.

Is it wise; is it for the best interest of all of this country's citizens to allow a competitor to tear down this structure, which has been and will continue to be the backbone of this country, if properly protected?

The government, through the Interstate Commerce Commission and through the public service commissions of the various states, requires railroads to maintain established service without variation; to charge specific published rates on both passenger and freight traffic; and will not permit railroads to alter their services or rates without permission.

Did you know that 79 per cent of live stock to National Stock Yards, St. Louis, in 1933 was handled via trucks? The railroads built and maintain their cattle pens, tracks and equipment for live stock shipments, but lost the business.

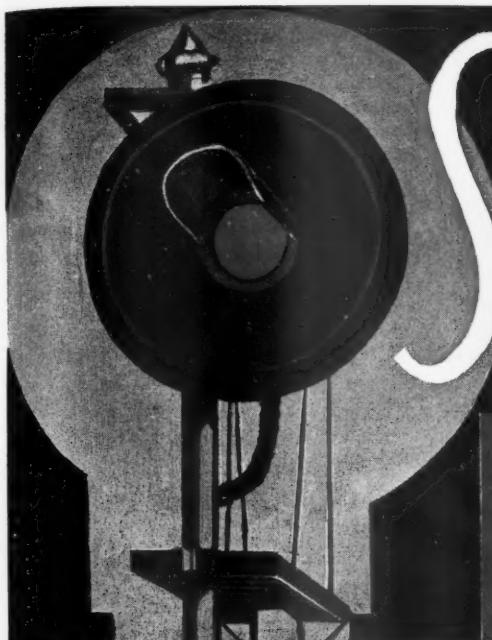
Railroads own their right of ways and tracks, maintain them, and pay taxes to every county and city through which they operate, as well as to the state and federal governments.

How long, Mr. Citizen, will you continue to permit this unregulated condition without protest to your legislators? Write your state and national legislators to remedy this unjust advantage now enjoyed by motor over rail transportation by placing all existing means of public transportation on an equality as to rates, services and taxation, so that all common carriers may be placed on a fair, competitive basis without favoritism or subsidies.

STOP FREE WHEELING ON THE HIGHWAYS!

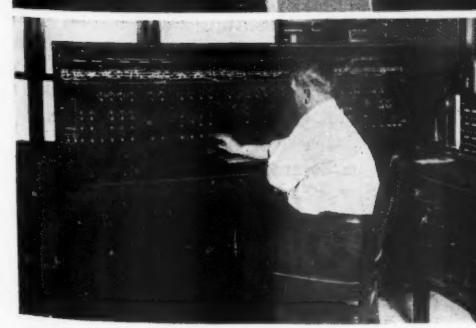
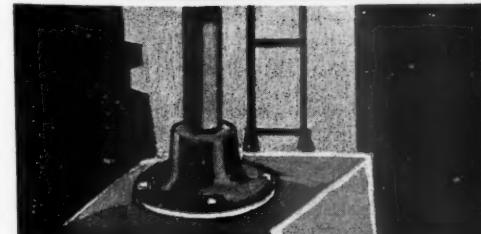
One of a Series of Circulars Portraying Unfair Advantages Enjoyed by Trucks, Prepared and Distributed by the Riverside Mills, Augusta, Ga.

Continued on next left-hand page



SIGNALING is one of the keys-

—which opens the door to better
railway transportation.



Visualize, if you can, a modern railroad operating without power interlockings or automatic block signals; without track circuits, highway crossing protection, or the many other modern forms of signaling so necessary to today's safe, rapid, efficient and economical operation. To meet successfully the severe demands for still better railway transportation, signaling will assume still greater importance in assuring the safety of passengers, cargo and equipment and in accelerating speed, efficiency and economy of operation. May we assist in solving your transportation problems?

1881



1934

Union Switch & Signal Co.
SWISSVALE, PA.

Ore., and will cost the government more than \$1,000,000. The work will include the construction of a bridge at Tanner Creek and a 600-ft. tunnel under Tooth Rock. Excavation is estimated at 165,000 cu. yd., while the overhaul from excavation will amount to 1,250,000 station yards and overhaul classed as borrow will total 9,000,000 station yards. A total of 20,000 ft. of timber piling will be required in addition to concrete and structural steel. There will be 300,000 cu. yd. of rock riprap. Rails for the relocated line will be furnished by the government.

Financial

BALTIMORE & OHIO.—*Notes Sold.*—Of the recent issue of \$50,000,000 of 4½ per cent five-year secured notes of this company offered to the public at par by Kuhn, Loeb & Co., Brown, Harriman & Co., and Speyer & Co., \$36,500,000 were sold. The remainder will be taken by the Reconstruction Finance Corporation at 99.

BOSTON & MAINE.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon the line of the New Boston Railroad from Parker, N. H., to New Boston, 5 miles.

R.F.C. Loans.—This company has applied to the Reconstruction Finance Corporation for a three-year extension of its loans amounting to \$7,569,437 which mature September 6.

CHESAPEAKE & OHIO.—*Acquisition of Indiana Company.*—This company has applied to the Interstate Commerce Commission for authority to purchase the railroad and other property of the Chesapeake & Ohio of Indiana. It now owns 59,995 shares of the outstanding 60,000 shares of stock and all the outstanding bonds of the Indiana company, \$8,452,000, and operates the property under lease. It proposes to pay for the property \$1 in cash in addition to assuming the obligations of the Indiana company, and to cancel the stock, bonds, and promissory notes and dissolve the affairs of the company.

ST. LOUIS SOUTHERN.—*Trackage Rights.*—The Interstate Commerce Commission has authorized this company to operate over a 1.3-mile track owned by the Vicksburg, Shreveport & Pacific (leased to the Yazoo & Mississippi Valley) in Shreveport, La.

Average Prices of Stocks and of Bonds

	Last Aug. 14	Last week	Last year
Average price of 20 representative railway stocks..	34.58	33.71	45.84
Average price of 20 representative railway bonds..	73.08	73.93	74.25

Dividends Declared

Cincinnati, New Orleans & Texas Pacific.—5 Per Cent Preferred, \$1.25, quarterly, payable September 1 to holders of record August 15.

Union Pacific.—Common, \$1.50; Preferred, \$2.00, semi-annually, both payable October 1 to holders of record September 1.

Wheeling & Lake Erie.—Prior Lien, \$7.00, payable August 18 to holders of record August 15. (On account of accumulated dividends.)

Railway Officers

TRAFFIC

B. S. Meeks has been appointed division freight agent of the Atlantic Coast Line, with headquarters at Columbia, S. C.

MECHANICAL

H. C. Trexler, who has been appointed superintendent of motive power of the Southern, with headquarters at Charlotte, N. C., as reported in the *Railway Age* of July 28, was born on January 3, 1894, at Rowan County, N. C. He was educated in the public schools and entered railway service in August, 1909, as a machinist's apprentice in the Spencer (N. C.) shops of the Southern. He was advanced to machinist in 1913 and 1919 he became machinist and erecting shop foreman at the same point. Mr. Trexler was appointed shop superintendent in 1924, remaining in that position until November, 1926, at which time he was appointed master mechanic at Somerset, Ky. Mr. Trexler was transferred to Spencer, N. C., in the same capacity in March, 1932, the position he held at the time of his recent promotion.

PURCHASES AND STORES

J. L. Irish, who has been appointed assistant general storekeeper of the Union Pacific Railroad and the St. Joseph & Grand Island, with headquarters at Omaha, Neb., to succeed O. Nelson, retired, was born in Osage, Iowa, on May 3, 1888, and entered the service of the Union Pacific in April, 1904, as a laborer in the store department at Starbuck, Wash. Six years later he was appointed requisition clerk in the store department at Albina, Ore., where he remained until December 1, 1930, advancing through various positions to

he was made assistant general storekeeper and his jurisdiction extended to include the Los Angeles & Salt Lake. He held this position until his appointment as assistant general storekeeper of the Union Pacific Railroad and the St. Joseph & Grand Island on July 15. A. R. Mullens, who has been appointed assistant general storekeeper at Pocatello, Idaho, to succeed Mr. Irish, was born in London, England, on August 30, 1884, and entered railway serv-



J. L. Irish

ice with the Union Pacific in 1900 as a laborer in the bridge and building department at Evanston, Wyo. In 1902 he was transferred to the store department in the same capacity and on August 11, 1916, was appointed general foreman of the store department at Cheyenne. After holding various positions in this department, he was appointed division storekeeper at that point on May 5, 1919, which position he has held until his recent promotion.

OBITUARY

Luther L. Yates, who retired as general superintendent car department of the Pacific Fruit Express on October 1, 1932, died at Monte Rio, Cal., on August 4.

J. W. Booth, assistant freight traffic manager of the Seaboard Air Line, with headquarters in Tampa, Fla., died in that city on August 1.

Edward L. Rossiter, treasurer of the New York Central, with headquarters at New York, died in a hospital in Bergen, Norway, on August 14. Mr. Rossiter was injured in a vehicular accident while on a vacation trip to Bergen and died from complications which resulted in pneumonia. Mr. Rossiter was born at Great Neck, L. I., on August 14, 1870. He was educated at Holbrook Military Academy, Brooklyn Polytechnic Institute and Flushing Institute. He entered railway service in 1887 in the treasury department of the New York Central & Hudson River (now N. Y. C.). In 1900 he was appointed assistant treasurer for that road and three years later he became its treasurer. In 1918 Mr. Rossiter became federal treasurer for the New York Central R. R., serving in that position until 1920, when, upon the return of the railroad to private control, he was appointed treasurer of the New York Central Lines.



A. R. Mullens

that of general storekeeper of the Oregon-Washington Railroad & Navigation Company at Portland, Ore. Mr. Irish was then appointed general storekeeper of the Oregon Short Line and the Oregon-Washington Railroad & Navigation Company, with headquarters at Pocatello, Idaho, remaining in that position until April 1, 1932, when

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